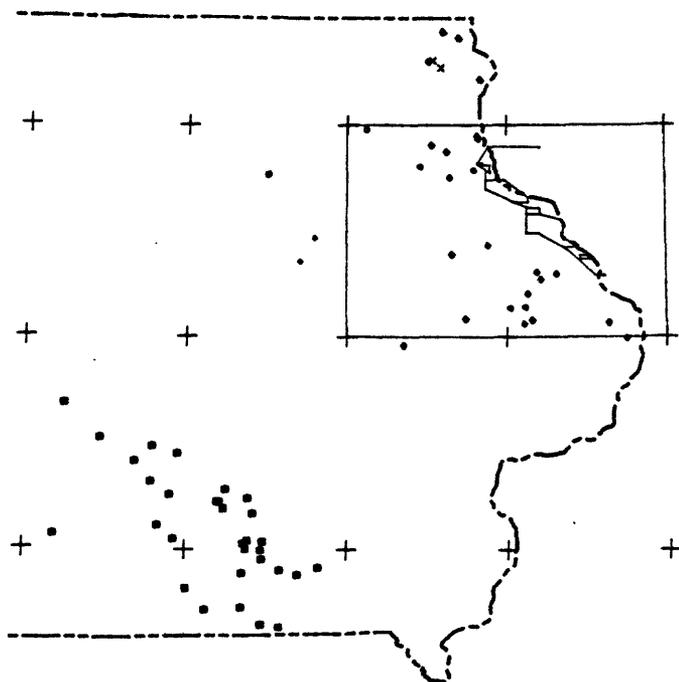


UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

GS MRDS - A SYSTEM BASED ON THE DATA FIELDS USED IN THE NATIONAL MRDS SYSTEM BUT USING dBASE III AND A MICROCOMPUTER (IBM PC OR COMPATIBLE) FOR ORGANIZING DATA ON MINERAL RESOURCE OCCURRENCES AND PROVIDING TABULAR AND GRAPHIC OUTPUT

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Open-File Report
86-450A
Program Disk
86-450B

DISCLAIMER

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Denver, Colorado
August 1986

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INTRODUCTION

The system described here was developed to assist compilation, analysis, and publication of mineral occurrence information developed by projects that deal with the assessment of mineral resource potential. Projects of this type generally produce large amounts of data that are difficult to organize and summarize in a publishable form. This system can be used to improve the efficiency of that process.

Design

System design started by examining the output required by the user, and ways of streamlining input. It is clear that the system should produce the various tables and map overlays that are needed for the typical (and the not-so-typical) mineral resource assessment with minimum time and effort on the part of the user. This broad goal led to specific objectives. The system must be able to search for and select parts of the database from the whole; it must be able to sort those parts or the entire database into various sequences based on the contained data; and it must be able to transmit the results to the computer screen for proofing, to the printer for display, and to disk for storage. The format of all forms of tabular data produced by the system must remain flexible. To generate the map overlays needed for a mineral assessment project, the system, again, must be able to find, select, and sort the data prior to plotting of required overlays. Mineral assessments often include data which is related to specific areas such as mining districts or mineralized zones in addition to data related to restricted locations such as outcrops or prospect pits. The system must be capable of plotting the outlines of areas as well as to point data.

In addition to providing the user with the products mentioned, several secondary objectives were identified during system design. The system must be as accessible and as portable as possible; therefore, it has been designed around a standard IBM PC (or PC clone) with standard peripherals. This version of this system was developed using the dBASE III database manager by Ashton-Tate. Although there are certain drawbacks to this database manager, its ease of use allowed a working version of the system to be developed in a short time. To provide a permanent record of the information generated by each project and to make that information available to subsequent projects in machine readable form, all data must be easily transferable to the National MRDS data file without modification. Production of usable map overlays depends heavily on the precision and accuracy of the location data entered into the system. To provide this precision and accuracy at the least cost to the user, we have implemented a system of transferring locations of points and area boundaries directly from maps to the database using a desktop digitizer. The process of data input and update includes full edit capability, thus enabling the compilation of data directly on the keyboard without the necessity of first writing draft copy in a fixed entry format. As data may be available in bits and pieces from various sources, the system accepts partial or extremely incomplete data, so that the database can evolve as data is accumulated. Incomplete records can be flagged if necessary so

that they do not appear in tables or on maps until they are complete and accurate.

GIGO !

**ALL data must be checked, edited, and corrected,
or none of it can be trusted.**

The system is intended to put as few constraints on the user as possible. Specific items are not required for each entry; the user can enter as much or as little data as he feels will be useful for his project. Flexibility and efficiency are the prime goals of this system. Comments regarding the system will be appreciated.

GS MRDS is a developmental system. It requires that the user develop an understanding of dBASE III command language for complete use. It can be operated for data input from a menu, but offers no "help" files, no entries by default, no data checking, and a minimum plot capability (Universal Transverse Mercator projection only). It provides the complete flexibility of dBASE for adding, deleting, or subdividing data fields, but cannot select from the text "memo" fields. A far more sophisticated system (GSMODS) is being put together based on the REVELATION data base manager. GSMODS is more economical of data storage, provides "help", considerable data checking, multi-value fields, and permits data selection from all fields. GSMODS is more suitable for large databases, and greatly speeds routine data entry. GS MRDS permits easy modification to suit particular needs, has been interfaced with GSMAP Version 3.0 (map compilation and drafting program), and is intended for small and special uses. This Open-File report provides easily modifiable programs, including source code, with all that this means to encourage the use of data base managers in meeting specific geologic needs.

MRDS is the acronym for Mineral Resource Data System, the national computer-based system of the U.S. Geological Survey maintaining information on mineral deposits and occurrences. In this report this system will be referred to as the national MRDS system. MRDS is used here as the database name for resource records; this emphasizes the tie between the two system; the PC-based system is designed to feed its information into the national system by electronic transfer, without rekeyboarding.

OF DATABASES, FILES, RECORDS, and FIELDS

A database is a collection of related pieces of information. The structure of the database reflects the relationships between the pieces of information contained in the database. The GS MRDS system consists of 3 databases which are interconnected. The main database (MRDS) contains the information that is specific to a particular site or area of interest. A secondary database (REFER) contains bibliographic references which may contain information concerning several locations. The final database in the system (MRDSGEO) contains the point location data generated by the digitizer.

The three databases are maintained in five separate files on the computer. The database MRDS is kept in two files named MRDS.DBF and MRDS.DBT. This database requires two separate files because there are two types of fields in the database are kept separatel; those with fixed length are kept in MRDS.DBF, and those with variable length are kept in MRDS.DBT. Similarly, REFER consists of two files named REFER.DBF and REFER.DBT. MRDSGEO is kept in one file named MRDSGEO.DBF because it only contains fields of fixed length.

Within each database, information is divided into records. A record in the MRDS database contains all the information that applies to a specific site or area of interest. Thus, each mine, deposit, occurrence, mining district, etc. which is considered as a distinct location for the purposes of the study will be represented in the MRDS database by a single record. Similarly, all of the information concerning a single bibliographic reference will be contained in one record in the REFER database, and point information for the geographic location obtained from the digitizer for a record in the MRDS database is contained in the MRDSGEO database.

Each record is subdivided into fields. A field may contain a single character such as a Y or N to indicate whether there has been production from a deposit, it may contain a word or several words such as a list of commodities, or it may contain an entire paragraph of description of some aspect of the deposit. The definitions of the fields, their lengths, their acceptable data types, and their relationships to each other make up the structure of the database. The structures of the databases in this system will be detailed below along with the definitions of the content of each field.

File structure for databases

MRDS

Database MRDS contains all basic information describing the attributes of the deposit or area in 44 fields. The characteristics of these fields, and their relations with the standard MRDS(CRIB) entries are shown below. Descriptions of the contents of these fields are provided in Appendix 1. Other fields can be added to meet the needs of the user.

Structure for database

MRDS.DBF

Field	Field name	Type	Width	CRIB-MRDS RECORD IDENTIFICATION
1	WF NUMBER	Character	5	B40
2	MRDS NO	Character	7	B10
3	CMR NO	Character	7	
4	REC TYPE	Character	2	
5	ENTRY DATE	Date	8	G1
6	INFO SRCE	Character	1	B30
7	REPORTER	Character	25	G2
8	REPORT AFF	Character	20	G5
9	SITE NAME	Character	40	A10
10	SYNONYMS	Character	68	A11
11	SITE TYPE	Character	1	
12	DIST AREA	Character	40	A30
13	COUNTY	Character	40	A40
14	STATE	Character	2	A50
15	COUNTRY	Character	2	A60
16	QUAD 2DEG	Character	25	A92
17	PRIME QUAD	Character	25	A90
18	SCALE	Numeric	7	A100
19	LATITUDE	Character	13	A70
20	LONGITUDE	Character	14	A80
**	CADASTRAL	Character	68	(optional field)
21	COMMODITYS	Character	68	C10
22	PRODUCTION	Character	1	PROD + YES or NO or UND
23	PROD INFO	Memo	10	D10
24	DEPOS TYPE	Character	68	C40
25	DEPOS CODE	Character	24	
26	HR LITH	Character	40	K1A
27	FORM HR	Character	25	N30A
28	AGE HR	Character	15	N30
29	AGE MINER	Character	15	K3
30	TECTON SET	Character	68	N15
31	AS IG LITH	Character	68	K2A
32	AGE AS IG	Character	15	K2
33	ORE MINER	Character	68	C30
34	N ORE MIN	Memo	10	K4
35	ORE CNTRLS	Memo	10	K5
36	DEPOS DESC	Memo	10	M110
37	COMMENTS	Memo	10	GEN
38	KEY WORDS	Character	68	
39	NOTES	Memo	10	
40	REF 1	Numeric	3	F1
41	REF 2	Numeric	3	F2
42	REF 3	Numeric	3	F3
43	REF 4	Numeric	3	F4
44	REF 5	Numeric	3	F5
**	Total **		971	

REFER

Database REFER contains three fields in each record that hold the bibliographic data on each reference used as a source of mineral resource information. Field 1, named AUTHOR, contains the last name of the first author, and is used in report generation to alphabetize the file. Field 2, named REFERENCE, contains the complete bibliographic reference in standard USGS bibliographic format. Field 3, named REF_NO, contains a reference number which the compiler assigns. Reference numbers are used in the last five fields of the MRDS data base so that complete bibliographic references need only be typed once into the REFER database: the computer will add these to the MRDS output as needed.

Structure for database REFER.DBF

Field	Field name	Type	Width
1	AUTHOR	Character	16
2	REFERENCE	Memo	10
3	REF_NO	Character	5
** Total **			32

MRDSGEO

Database MRDSGEO contains latitude and longitude data for records in the MRDS database. Its three fields contain the WF NUMBER, LATITUDE, and LONGITUDE also contained in the MRDS database (MRDS.DBF file). MRDSGEO is used as a part of the process of digitizing data from maps, and inserting this data into the MRDS database.

Structure for database : C:MRDSGEO.DBF

Number of data records :	24			
Date of last update :	05/17/85			
Field	Field name	Type	Width	Dec
1	WF NUMBER	Character	5	
2	LATITUDE	Character	13	
3	LONGITUDE	Character	14	
** Total **			33	

A sample of a MRDSGEO.DBF FILE is shown below.

Record#	WF NUMBER	LATITUDE	LONGITUDE
1	00002	38 14 07.163N	105 43 38.673W
2	00003	38 13 29.788N	105 44 39.355W
3	00004	38 13 15.135N	105 44 20.276W
4	00005	38 14 02.249N	105 40 46.147W
5	00006	38 13 43.218N	105 40 21.762W

DATA - A RECORD AND ITS PIECES

Entering data is done by typing into a series of "fields" shown on the screen in a tabular format. The information appears on the screen except for the text fields labeled "memo".

Memo fields

Memo fields are used for descriptive entries that may or may not be lengthy in order to minimize storing "blanks" in the database file. A line of text in a memo field can be up to 67 characters wide, and a memo field can contain up to 4,000 characters. Entry is made using a standard word processing screen editor included with dBASE III that closely resembles WORDSTAR.

Appearance of a completed record

The data screens for a sample record in the MRDS database appear as shown below, using dBASE III: the contents of the several memo fields have been below the entry screens. A non-standard field (SAF) has been added to the third screen to contain data points outlining the area described.

```
Record No.      1
WF_NUMBER      00001
MRDS_NO
CMR_NO         0006000
REC_TYPE       AM
ENTRY_DATE     01/23/85
INFO_SRCE      1
REPORTER       Taylor, R.B.
REPORT_AFF     USGS
SITE_NAME      Verde Creek area
SYNONYMS

SITE_TYPE      A
DIST_AREA      Verde Creek area
COUNTY        Custer
STATE          CO
COUNTRY        US
QUAD_2DEG     Pueblo
PRIME_QUAD     Beckwith Mountain
SCALE          24000
LATITUDE       38 07 53.297N
LONGITUDE      105 35 59.427W
```

MRDS Screen 1

Record No. 1
LONGITUDE 105 35 59.427W
COMMODITYS Ag, Cu

PRODUCTION Y
PROD_INFO memo
DEPOS_TYPE vein

DEPOS_CODE 55.1
HR_LITH granitic gneiss
FORM_HR no formal name
AGE_HR E PROT
AGE_MINER OLIGO ?
TECTON_SET Rocky Mountain Cordillera

AS_IG_LITH

AGE_AS_IG
ORE_MINER chalcopyrite, galena

N_ORE_MIN memo
ORE_CNTRLS memo

dBASE Word Processor

Known production prior to 1901; no data on amount, either tonnage or grade. Size of dumps suggests small production; area primarily known for silver.

dBASE Word Processor

Quartz veins contain minor barite and sulfide minerals; no data on alteration minerals; the host gneiss is sheared and chloritized, but the chlorite may not be related to the vein system.

dBASE Word Processor

Veins follow fractures and shears in Precambrian gneiss and adjacent Pennsylvanian-Permian rocks near the range-front fault separating the Sangre de Cristo Range from the Wet Mountain Valley graben to the east.

MRDS Screen 2

Record No. 1
ORE_CNTRLS memo
DEPOS_DESC memo
COMMENTS memo
KEY_WORDS vein

NOTES memo
REF_1 1
REF_2 0
REF_3 0
REF_4 0
REF_5 0
SAF memo

dBASE Word Processor

Quartz veins of unspecified size are chiefly in fractured Precambrian gneiss; mineralization extended into adjacent sedimentary rocks but veins there are lower in grade. Assays show silver in about half of the veins sampled (grab samples, .x-61 oz Ag/ton); a few samples contained gold (.05 oz Au/ton). No information of continuity of veins; most less than a foot thick.

dBASE Word Processor

Mineralized area bounded by faults on west side, covered by Quaternary rocks to north and south and by Miocene valley-fill to east; mineralization perhaps related to hydrothermal system set up by the Oligocene Rita Alto stock, with permeability related to fractures near the Sangre de Cristo fault.

dBASE Word Processor

00001

38 08 10.903N105 36 01.389W
38 08 07.834N105 35 57.979W
38 08 04.525N105 35 54.046W
38 07 58.571N105 35 52.390W
38 07 53.738N105 35 52.630W
38 07 49.881N105 35 50.155W
38 07 44.827N105 35 46.236W
38 07 39.127N105 35 43.601W
38 07 35.067N105 35 44.061W
38 07 32.662N105 35 46.387W
38 07 33.548N105 35 52.971W
38 07 37.862N105 35 55.718W
38 07 38.041N105 35 55.942W
38 07 42.932N105 35 59.035W
38 07 46.760N105 36 03.566W
38 07 50.545N105 36 07.421W
38 07 59.483N105 36 07.849W
38 08 02.410N105 36 06.697W
38 08 09.064N105 36 05.841W
38 08 10.903N105 36 01.389W

MRDS Screen 3

Printed output

Formats for printing data are flexible, and can be modified to suit the user. Three different formats are illustrated here, two generated by dBASE programs, and the third by a dBASE report written to accompany MRDS.

Listall

This list is obtained either by using the LISTALL.PRG program, or by MENU request (see below). This record contains the field names used in the MRDS data base.

LISTING OF DATA FIELDS FOR RECORD

1

WF_NUMBER : 00001
MRDS_NO :
CMR_NO : 0006000
REC_TYPE : AM
ENTRY_DATE : 01/23/85
INFO_SRCE : 1
REPORTER : Taylor, R.B.
REPORT_AFF : USGS
SITE_NAME : Verde Creek area
SYNONYMS :
SITE_TYPE : A
DIST_AREA : Verde Creek area
COUNTY : Custer
STATE : CO
COUNTRY : US
2 DEG QUAD : Pueblo
PRIME_QUAD : Beckwith Mountain
SCALE : 24000
LATITUDE : 38 07 53.297N
LONGITUDE : 105 35 59.427W
COMMODITYS : Ag, Cu
PRODUCTION : Y
PROD_INFO : Known production prior to 1901; no data on amount,
either tonnage or grade. Size of dumps suggests
small production; area primarily known for silver.
DEPOS_TYPE : vein
DEPOS_CODE : 55.1
HR_LITH : granitic gneiss
FORM_HR : no formal name
AGE_HR : E PROT
AGE_MINER : OLIGO ?
TECTON_SET : Rocky Mountain Cordillera
AS_IG_LITH :
AGE_AS_IG :
ORE_MINER : chalcopyrite, galena
N_ORE_MIN : Quartz veins contain minor barite and sulfide
minerals; no data on alteration minerals; the host
gneiss is sheared and chloritized, but the
chlorite may not be related to the vein system.

ORE_CNTRL : Veins follow fractures and shears in Precambrian gneiss and adjacent Pennsylvanian-Permian rocks near the range-front fault separating the Sangre de Cristo Range from the Wet Mountain Valley graben to the east.

DEPOS_DESC : Quartz veins of unspecified size are chiefly in fractured Precambrian gneiss; mineralization extended into adjacent sedimentary rocks but veins there are lower in grade. Assays show silver in about half of the veins sampled (grab samples, .x-61 oz Ag/ton); a few samples contained gold (.05 oz Au/ton). No information of continuity of veins; most less than a foot thick.

COMMENTS : Mineralized area bounded by faults on west side, covered by Quaternary rocks to north and south and by Miocene valley-fill to east; mineralization perhaps related to hydrothermal system set up by the Oligocene Rita Alto stock, with permeability related to fractures near the Sangre de Cristo fault.

KEY WORDS : vein

NOTES : A few ounces of gold may(?) have been produced in 1931.

REF_1 : Ellis, C. L., Hannigan, B.J., Thompson, J. R., 1983, Mineral investigation of Sangre de Cristo Wilderness Study Area, Alamosa, Custer, Fremont, Huerfano, and Saguache Counties, Colorado: U.S. Bureau of Mines, Open-File Report, MLA 65-83, 190p.

PUBLIST1.PRG

Another way of printing the same record, in a format more suitable for publication is provided by the program PUBLIST1.PRG.

LIST OF DATA FOR RECORD 1

Site : Verde Creek area
 Synonyms :
 District : Verde Creek area
 File number : 00001 Site type: A Record type: AM Production: Y
 Reporter : Taylor, R.B. Entry date: 01/23/85
 County : Custer State: CO
 2o Quad : Pueblo Scale : 1:250,000
 Primary Quad: Beckwith Mountain Scale : 1: 24000
 Latitude : 38 07 53.297N Longitude : 105 35 59.427W

Deposit type: vein
 Deposit code: 55.1 Commodities : Ag, Cu
 Production : Known production prior to 1901; no data on amount,
 either tonnage or grade. Size of dumps suggests
 small production; area primarily known for silver.

Host rock:
 Name : no formal name Lithology: granitic gneiss Age : E PROT

Mineralization
 Age : OLIGO ?

Associated igneous rocks:
 Lithology: Age :

Tectonic setting: Rocky Mountain Cordillera

Ore minerals: chalcopyrite, galena

Deposit characteristics:

Mineralogy:	Ore controls:	Description:	Comments:
Quartz veins contain minor barite and sulfide minerals; no data on alteration minerals; the host gneiss is sheared and chloritized, but the chlorite may not be related to the vein system.	Veins follow fractures and snears in Precambrian gneiss and adjacent Pennsylvanian-Permian rocks near the range-front fault separating the Sangre de Cristo Range from the Wet Mountain Valley graben to the east.	Quartz veins of unspecified size are chiefly in fractured Precambrian gneiss; mineralization extended into adjacent sedimentary rocks but veins there are lower in grade. Assays show silver in about half of the veins sampled (grab samples, .x-61 oz Ag/ton); a few samples contained gold (.05 oz Au/ton). No information of continuity of veins; most less than a foot thick.	Mineralized area bounded by faults on west side, covered by Quaternary rocks to north and south and by Miocene valley-fill to east; mineralization perhaps related to hydrothermal system set up by the Oligocene Rita Alto stock, with permeability related to fractures near the Sangre de Cristo fault.

References: Ellis, C. L., Hannigan, B.J., Thompson, J. R.,
 1983, Mineral investigation of Sangre de Cristo
 Wilderness Study Area, Alamosa, Custer, Fremont,
 Huerfano, and Saguache Counties, Colorado: U.S.
 Bureau of Mines, Open-File Report, MLA 65-83,
 190p.

COLO.FRM

Output in many other forms can be generated using the report capabilities of dBASE III, and by writing programs in dBASE command language. The example provided on the following page, is a report named COLO designed for Colorado data. A portion of this report was abstracted to obtain the summary provided below.

MINERAL RESOURCES OF COLORADO					
NUMBER	NAME	LATITUDE/ LONGITUDE	COMMODITIES	PRODUCTION	REFERENCES
00001	Verde Creek area	38 07 53.297N/ 105 35 59.427W	Ag, Cu	Known production prior to 1901; no data on amount, either tonnage or grade. Size of dumps suggests small production; area primarily known for silver.	1
00002	Cloverdale mine	38 14 07.626N/ 105 43 39.058W	Cu	A few ounces of gold may(?) have been produced in 1931.	1
00003	Cloverdale Basin (mineralized area)	38 13 29.687N/ 105 44 39.375W	Mo	None	1
00004	unnamed prospect	38 13 15.256N/ 105 44 20.332W	Mo	None	3
00005	Rita Alta mine	38 14 02.354N/ 105 40 46.775W	Cu, Ag, Au	Cu, Ag, and Au produced in the early 1930's; but the amount is not recorded.	1
00006	Peerless tunnel	38 13 43.050N/ 105 40 22.284W	Cu	The Peerless tunnel was driven in search of copper in the mid-1950's; no information on production.	1

NUMBER	NAME	LATITUDE/ LONGITUDE	COMMODITIES	ORE MINERALS	MINERALOGY	HOST ROCK	HIST ROCK REE	DESCRIPTION	AGE OF MINERALS- IZATION	USE CONTROLS	PRODUCTION	COMMENTS	REF
00001	Verde Creek area	38 07 53.297N/ 105 35 59.427W	Pb, Cu	chalcocopyrite, galena	Quartz veins contain granitic minor barite and sulfide minerals; no data on alteration minerals; the host gneiss is sheared and chloritized, but the chlorite may not be related to the vein system.	granitic gneiss	E PROT	Quartz veins of unspecified size are chiefly in fractured Precambrian gneiss; mineralization extended into adjacent sedimentary rocks but veins there are lower in grade. Assays show silver in about half of the veins sampled (grab samples, n=61 or 8g/ton); a few samples contained gold (1.05 oz Au/ton). No information of continuity of veins; most less than a foot thick.	DLIBD ?	Veins follow fractures and shears in Precambrian gneiss and adjacent Pennsylvanian-Permian rocks near the range-front fault separating the Sangre de Cristo flange from the Mt Mountain Valley graben to the east.	Known production data on amount, either tonnage or dumps suggests small production; area primarily known for silver.	Mineralized area bounded by faults on west side, covered by Quaternary rocks to north and south and by Miocene valley-fill to east; mineralization perhaps related to hydrothermal system set up by the Oligocene Rita Alto stock, with permeability related to fractures near the Sangre de Cristo fault.	1 0
00002	Cloverdale mine	38 13 07.626N/ 105 43 39.058W	Cu	chalcocopyrite ? secondary minerals	Vein at top of ridge has barite gangue, contains chalcocopyrite, pyrite, and minor bornite; parts have malachite stain.	sandstone, mudstone	PEM PEM	Cloverdale mine workings driven to intersect copper-bearing vein seen at top of ridge to the south of mine, but apparently did not find vein.	DLIBD ?	Fracture zones related to major faults.	A few ounces of gold may(?) have been produced in 1931.	Cloverdale Mine has about 1600 feet of workings.	1 0
00003	Cloverdale Basin (mineralized area)	38 13 29.687N/ 105 44 39.375W	Mo	molybdenite	Molybdenite occurs in quartz veins, or in fault gouge with chlorite and other alteration minerals.	granodiorite	DLIBD	Mineralized area about 1 1/2 long, .2 1/2 wide, NW trend, parallels fault cutting stock. Veins irregularly distributed, most very narrow.	DLIBD	Veins controlled by fractures in pluton, and by a through-going fault with several feet of gouge.	None	The vein zone was drilled in the 1960's looking for a concealed porphyry, apparently with discouraging results.	1 0
00004	unnamed prospect	38 13 15.256N/ 105 44 20.328W	Mo	molybdenite	Quartz veins, locally with comb structure and open vugs contain small (up to 1 cm) clots of coarse molybdenite flakes, and a few small pyrite crystals.	granodiorite	DLIBD	Quartz veins are up to 3' thick.	DLIBD	Veins in fractures in granodiorite; reason for location of veins not apparent.	None	Prospects here described by Worcester, 1916, p. 52-53; abundant float from veins at base of rock outcrops southeast of prospect.	1 2
00005	Rita Alta mine	38 14 02.354N/ 105 40 46.775W	Cu, Ag, Au	chalcocopyrite, secondary copper minerals	Quartz-barite veins contain chalcocopyrite and pyrite. Chlorite, hematite, and calcite mentioned, Table 12, Ellis et al, 1983.	sandstone, mudstone	PEM PEM	Mineralized area lies between two faults that parallel the east side of the Sangre de Cristo flange.	DLIBD ?	Fractures localizing veins are probably subparallel to, and related to range-front faulting (NW trend) along east side of Sangre de Cristo Range.	Cu, Ag, and Au produced in the early 1930's, but the amount is not recorded.	Underground workings of a few thousand feet indicated by early 1930's, but the amount is not recorded.	1 0
00006	Peerless tunnel	38 13 43.058N/ 105 40 22.284W	Cu	not known, chalcocopyrite ?		sandstone, mudstone	PEM PEM	Veins, no details.	DLIBD ?	Veins in fractures in sedimentary rocks between major	The Peerless tunnel was driven in search of	It was reported in the early 1950's, but is not present	1 0 0 0 0

GETTING STARTED — dBASE III

The following assumes that a series of steps have already been taken on the microcomputer to be used for compilation of this database.

- 1) The microcomputer is verified as fully compatible with the IBM PC (or PC/XT), is operational, and runs on DOS 2.2 or higher.
- 2) dBASE III or dBASE III PLUS has been installed.
- 3) The following files and programs are available; these are included on the disk that is a part of this Open-File report.

MRDS.DBF	MRDS.DBT	mineral resource data
REFER.DBF	REFER.DBT	references
MRDSGEO.DBF		data from digitizer for lat-long
MENU.PRG		program generating "menu"
LISTALL.PRG		program to generate list of data
PUBLIST1.PRG		program to generate list of data
PUBLIST.FRM		report used in PUBLIST1.PRG
MENUPROC.PRG		program makes menu "work"
MRDSOUT.PRG		program generates MRDS-format output
SMURFD.EXE		digitizing program, GTCO digitizer
UPDATE.PRG		program adds lat-long to MRDS.DBF
COLO.FRM		output - example of a report from MRDS
CITATION.FRM		output - example of report from REFER
FILECONV.EXE		changes a MRDS.TXT output file to MRDS format
GEO.FRM		output creates point plot file
SMURFP.EXE		program permitting plotting of data data

To start:

Enter the world of dBase III by:

At the prompt:

```
C> (or some other drive)   enter
C>DBASE                    (throughout this report, boldface will
                             be used to designate entries made
                             by the operator; use of the enter key
                             following the command will be assumed)
```

A screen-full of words related to dBASE III will be seen, and at the bottom a dot prompt:

.DO MENU

The following screen will be seen:

GS MRDS

- - - - - M A I N M E N U - - - - -

- 1 - LIST CONTENTS OF RECORD
- 2 - EDIT AN EXISTING RECORD
- 3 - ADD A NEW RECORD
- 4 - RETRIEVE BY GEOGRAPHIC AREA
- 5 - ADD A REFERENCE TO THE REFERENCE FILE
- 6 - RETRIEVE BY DEPOSIT TYPE CODE
- 7 - EXIT FROM GS MRDS TO DBASE COMMAND LEVEL

ENTER DESIRED OPTION BY NUMBER (CR):

1 - LIST CONTENTS OF RECORD

At the main menu ? Try option 1

A second screen says:

LISTREC - LISTS ALL FIELDS ON PRINTER

ENTER FIRST RECORD NUMBER : 1

ENTER FINAL RECORD NUMBER : 10

The numbers are in the screen provide a default selecting the first 10 records; change them to indicate the records that you want to print. If you want a single record, put in the same number twice. A single record is shown on pages 14-15; the number at the top is the dBASE record number, -- not the WF_NUMBER, the MRDS_NO or the CMR_NO, see the structure of the database. The record number is assigned by the PC in the sequence of entry of the record. This listing is generated by the program LISTALL.PRG; it also generates an ASCII file named LISTALL.TXT which can be edited using a standard word processing program, should such be needed.

2 - EDIT AN EXISTING RECORD

Back at the main menu? Enter 2 for option 2, to edit (or view) a record.

ENTER NUMBER OF RECORD TO BE EDITED:

Follow directions. Enter the record number, in this example number 1 --
ENTER NUMBER OF RECORD TO BE EDITED: 1

Screen 1 on the MRDS entry form is displayed -
and in sequence, using the PgDn key to activate the
form, Screen 2 and Screen 3 (examples have been given
previously)

The "memo" fields show only the word "MEMO" on the screen:
- to see or edit the contents, move the cursor to the
field and press ^Home (the Ctrl and Home keys held down
at the same time)
- to go back to the main form, press ^End (or ^W)

Note that the third screen displays references by number - these are
integrated with the contents of the reference file REFER.DBFG which contains
the full reference.

To go back to the menu, press ^W, while one of the main
screens is displayed.

3 - ADD A NEW RECORD

Back at the main menu ? Try option 3

The MRDS form displayed is ready to be filed in. Use ^W to go back to the main menu.

4 - RETRIEVE BY GEOGRAPHIC AREA

Back at the main menu ? Try option 4

A screen will be displayed that needs to be filled in. The requested format must be used. The example below has been completed.

A printout is provided, as below: for the latitude/longitude box specified here, four records were found, their numbers and latitudes and longitudes have been printed.

RETRIEVAL BY GEOGRAPHIC BOX

ENTER LOWER LATITUDE (DDMMSS) : 380000
ENTER UPPER LATITUDE (DDMMSS) : 383000
ENTER LEFT LONGITUDE (DDMMSS): 1060000
ENTER RIGHT LONGITUDE (DDMMSS): 1050000

1	38	7	53.242N	105	35	59.564W
2	38	14	7.156N	105	43	39.072W
3	38	13	14.949N	105	44	39.183W
11	38	23	17.653N	105	42	21.163W

5 - ADD A REFERENCE TO THE REFERENCE FILE

With the Menu screen displayed, try option 5

A completed REFER form looks like entry following; the contents of the MEMO field aren't shown except when editing or entering the field; again, the memo field is entered by positioning the cursor on it, pressing ^Home. Returning to the main form is done using ^END (or ^W)

The PgUp key is used to go back one record, the PgDn key to go forward one record. ^W saves the newly entered record, and returns the compiler to the main menu.

```
Record No.      1
AUTHOR         ELLIS
REFERENCE      memo
REF_NO         1
```

(REFERENCE memo field)

dBASE Word Processor

Ellis, C. L., Hannigan, B. J., and Thompson, J. R., 1983, Mineral investigation of Sangre de Cristo Wilderness Study Area, Alamosa, Custer, Fremont, Huerfano, and Saguache Counties, Colorado: U.S. Bureau of Mines, Open-File Report, MLA 65-83, 190p.

6 - RETRIEVE BY DEPOSIT TYPE CODE

Back at the main menu ? Try option 6

6

This option allows you to select a deposit type number from the table (see Appendix 1) and obtain a listing of all the deposits in the file for which the number has been used. In this example 30 was chosen --- all 30, 30.x, or 30.xx deposits will be listed. (A 30.6 will select all 30.6 and 30.6x records, but miss 30., and 30.x records, unless x=6.)

Five records were found, and their record numbers and deposit codes were written out:

ENTER DEPOSIT TYPE CODE: 30

8	30.8
9	30.8
10	30.8
11	30.8
15	30.83

7 - EXIT FROM GS MRDS TO DBASE COMMAND LEVEL

To leave the part of MRDS controlled by the MENU, select option 7 -- 7 and the dot prompt informs you that you are back in dBASE III.

FROM THE DOT PROMPT

Using dBASE III from the dot prompt (.) provides the power and utility of the dBASE command language for selecting the parts of the database desired, and for generating tabular reports in any desired format. These reports can be printed directly, sent to an ASCII file, or both can be done simultaneously. Printing provides a complete and immediate copy of the table; the ASCII file provides a file that can be edited using a word processing program, and thus polished for inclusion in a published report.

dBase III offers many options for creating tabular reports from MRDS data in standardized formats or in newly created formats that meet a specific need.

The procedures listed below use standard features of dBASE III, features described in the documentation included with the program. The dot prompt "." provides the start for the listing of the commands. Some commands only work when given in capital letters, so it is recommended that all commands be given with CAPS LOCK activated.

Reporting

With dBASE III, reports can either be printed directly, sent to an output file, or both can be done simultaneously. Commands for reports look like the simple example given below:

.USE MRDS	Opens MRDS database
.REPORT FORM COLO	This is the standard command format requesting that a report be made: all records will be included; the report named COLO will be used.

To print

Several options are available to send the report to the printer; either add TO PRINT at the end of the list of commands, use the ^P toggle, or use the command:

.SET PRINT ON before the **.REPORT** command.

Example: **.SET PRINT ON**
 .REPORT FORM COLO
 .SET PRINT OFF

or:

.REPORT FORM COLO TO PRINT

To an output file

Reports can be sent to an output file by using commands based on the word ALTERNATE. Example:

```
.USE MRDS
.SET ALTERNATE TO ABC.TXT      sets up a procedure for sending
                                output to a file named ABC.TXT
.SET ALTERNATE ON              sets up the transmission to the
                                file
.REPORT FORM COLO
.SET ALTERNATE OFF             turns off the transmission of
                                the file and closes the text
                                file, retaining the data
                                transmitted
```

Caution: The sequence of the commands is important. Reversing the order of the first two commands (.SET ALTERNATE ON, then .SET ALTERNATE TO ABC.TXT) works, but the output winds up in a file named ALTERNATE.TXT, not in the file ABC.TXT where it would be expected.

Both

Reports can go simultaneously to print and to an output file by using both sets of commands. A set of commands might look like this:

```
.USE MRDS
.SET ALTERNATE TO ABC.TXT
.SET ALTERNATE ON
.REPORT FORM COLO TO PRINT
.SET ALTERNATE OFF
.SET PRINT OFF
```

The file ABC.TXT can then be edited using a word processing program, best in a mode allowing lengthy lines -- many tables will exceed the 80 character length of lines in standard document files.

Tabular reports of mineral resource data

An example of a tabular report was included above. dBASE commands were used to select data so that only a part of the database was used. Commands for selecting records are described in the dBASE III documentation.

COLO

An example of a tabular report, named COLO, is provided here. A single record in this format is shown in Fig. 1. To obtain this report, a series of instructions must be used:

- .USE MRDS** This specifies the database
- .REPORT FORM COLO FOR "00001" \$ WF_NUMBER TO PRINT**
 - . The dot prompt shows that the system is ready
 - REPORT FORM specifies that a report is desired, COLO names the desired report
 - FOR is used to request that a part of the data is desired
 - "00001" specifies the record sought
 - \$ tells the computer to look anywhere within the field specified, not just at the beginning of the field
 - WF_NUMBER is the name of the field to be searched for the characters "00001"
 - TO PRINT sends the output to the printer, rather than just displaying it on screen.

If the report is to go to a file as well as to print:

- .USE MRDS**
- .SET ALTERNATE TO FILE.TXT** Sets output to file named FILE.TXT
- .SET ALTERNATE ON** Sets output to file on
- .SET PRINT ON** Sets printer on
- .REPORT FORM COLO FOR "00001" \$ WF_NUMBER TO PRINT** See above
- .SET ALTERNATE OFF** Closes output file - otherwise all the data leaks out
- .SET PRINT OFF** Sets printer off

This creates a file FILE.TXT in the same directory as dBASE which contains the contents of the report; sending a second report to this file appends the second report to the first, and so on. Use a word processing program to edit these files. If WORDSTAR, set as a NONDOCUMENT to avoid strange word wrap patterns (COLO exceeds the 80 character length of the standard line length).

dBASE III has great capabilities for report generation in tabular format, including the ability to build individualized formats, sort on the basis of record content (not within memo fields), specify record sequence using indexing, and group records with headings (such as County, State, etc.). These capabilities are described in dBASE III documentation.

Excluding records

Incomplete, or possibly unreliable records can be marked so that they can be excluded from output tables, unless a "complete" set is desired. This can be done as follows:

Marking is done by:

.USE MRDS This defines the database
.DELETE RECORD 12 This marks the record to be excluded

This marks Record 12 so that it will not be included in an output table if the instruction

.SET DELETED ON
is given before the command to produce a report is made.

.SET DELETED OFF is the instruction which changes the system that all records will appear in the output. Note that the record isn't actually gone when the delete marking is given.

WARNING !! If the command **.PACK** is given, these "deleted" records will be erased and cannot be recalled. Despite its appearance, the **PACK** command does not save space in the **dBASE** file.

.RECALL RECORD 12 will take the "delete" label off of record 12 and restore it to full status in the data base;

Bibliographic reports

The reference file **REFER** is used to store all references. In this way, the reference is typed only once; it is available in reference fields in occurrence records, and can be printed separately in correct format when needed for information or for publication.

Lists of references (1) in numerical sequence and (2) in alphabetical sequence are needed during the compilation process to keep the reference numbers and references organized. A report called **CITATION** provides this information, and can be used to compile a reference list ready for edit at publication stage.

CITATION - two ways

Numerical sequence: the following sequence of commands prints out a reference list in numerical sequence:

```
.USE REFER  
.REPORT FORM CITATION TO PRINT
```

Alphabetical (almost) sequence: the following sequence of commands prints out a reference list alphabetized by the last name of the senior author, and in numerical sequence thereafter. This does not sort out the Smiths, nor the 1949a,b,c's, but it makes finding a reference in the list easy, and with word processing, the edit process simple to go to publication format.

```
.USE REFER  
.INDEX ON AUTHOR TO AUT INDEX  
.USE REFER INDEX AUT INDEX  
.REPORT FORM CITATION TO PRINT  
.CLOSE DATA BASES
```

If an alphabetized (almost) listing is needed in a file for word processing:

```
.USE REFER  
.INDEX ON AUTHOR TO AUT INDEX  
.USE REFER INDEX AUT INDEX  
.SET ALTERNATE TO REF.TXT  
.SET ALTERNATE ON  
.REPORT FORM CITATION TO PRINT  
.SET ALTERNATE OFF  
.CLOSE DATABASES
```

A text file REF.TXT is generated which can be used in a word processor, as well as a printed copy for review. Examples of these two reference lists follow.

REFERENCES CITED

NUMBER REFERENCES

- 1 Ellis, C. L., Hannigan, B.J., Thompson, J. R., 1983, Mineral investigation of Sangre de Cristo Wilderness Study Area, Alamosa, Custer, Fremont, Huerfano, and Saguache Counties, Colorado: U.S. Bureau of Mines, Open-File Report, MLA 65-83, 190p.
- 2 Worchester, P. G., 1919, Molybdenum deposits of Colorado; with general notes on the molybdenum industry: Colorado Geological Survey Bulletin 14, 131 p.
- 3 Vanderwilt, J. W., 1947, Mineral Resources of Colorado: State of Colorado Mineral Resources Board, Denver, Colorado, 547 p.
- 4 Adams, J. W., 1953, Beryllium deposits of the Mount Antero region, Chaffee County, Colorado: U.S. Geological Survey Bulletin 982-D, p. 95-119.
- 5 Armbrustmacher, T. J., 1976, Thorium deposits in the Wet Mountains area, Fremont and Custer Counties, Colorado: U.S. Geological Survey Open-File Report 78-177, 18p.
- 6 Del Rio, S. M. ed., 1960, Mineral resources of Colorado, first sequel: Denver, Colorado Mineral Resources Board, 764 p.
- 7 Hanley, J. B., Heinrich, E. W., and Page, L. R., 1950, Pegmatite investigations in Colorado, Wyoming, and Utah 1942-1944: U.S. Geological Survey Professional Paper 227, 125p.
- 8 Parker, B. H., 1974, Gold placers of Colorado: Colorado School of Mines Quarterly, v. 69, no. 3, 168 p., and no. 4, 224 p.
- 9 Sheridan, D. M., and Raymond, W. H., 1984, Preliminary report on the geology of the Sedalia mine area and its Proterozoic deposits of base-metal sulfides and gahnite, Chaffee County, Colorado: U.S. Geological Survey Open-File Report 84-0800, 27 p.
- 10 Sheridan, D. M., and Raymond, W. H., 1984, Precambrian deposits of zinc-copper-lead sulfides and zinc spinel (gahnite) in Colorado: U.S. Geological Survey Bulletin 1550, 31 p.
- 11 Heinrich, E. W., 1981, Precambrian tungsten and copper-zinc deposits of south-central Colorado: Colorado Geological Survey Resource Series 21, 115 p.

Alphabetical order

40 records indexed

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REFERENCES CITED

NUMBER REFERENCES

- 4 Adams, J. W., 1953, Beryllium deposits of the Mount Antero region, Chaffee County, Colorado: U.S. Geological Survey Bulletin 982-D, p. 95-119.
- 5 Armbrustmacher, T. J., 1976, Thorium deposits in the Wet Mountains area, Fremont and Custer Counties, Colorado: U.S. Geological Survey Open-File Report 78-177, 18p.
- 16 Becker, R. M., Shannon, S. S., Jr., and Rose, C. K., 1961, Iron Mountain titaniferous magnetite deposit, Fremont County, Colorado: U.S. Bureau of Mines Information Circular 5864, 18 p.
- 30 Boyer, R. E., 1963, Mineralized xenoliths in the southern Wet Mountains, Colorado: Wyoming Contributions to Geology, v.2, no. 2, p. 147-150.
- 26 Bush, Alfred L., 1951, Sources of lightweight aggregate in Colorado: Colorado Scientific Society Proceedings, v. 15, No. 8, p. 305-368.
- 20 Cross, Whitman, and Penrose, R. A. F., Jr., 1895, Geology and mining industries of the Cripple Creek district, Colorado: U.S. Geological Survey 16th Annual Report, Pt. 2, 209 p.
- 27 Cross, C. W., 1896, Geology of Silver Cliff and the Rosita Hills, Colorado: U.S. Geological Survey 17th Annual Report, Part 2, pp. 263-403.
- 19 Dahlem, D. H., 1965, Geology of the Lookout Mountain area, Fremont County, Colorado: University of Michigan, unpublished thesis, 177 p.
- 6 Del Rio, S. M. ed., 1960, Mineral resources of Colorado, first sequel: Denver, Colorado Mineral Resources Board, 764 p.
- 1 Ellis, C. L., Hannigan, B.J., Thompson, J. R., 1983, Mineral investigation of Sangre de Cristo Wilderness Study Area, Alamosa, Custer, Fremont, Huerfano, and Saguache Counties, Colorado: U.S. Bureau of Mines, Open-File Report, MLA 65-83, 190p.
- 28 Emmons, S. F., 1896, The mines of Custer County, Colorado: U.S. Geological Survey 17th Annual Report, Part 2, pp. 405-472.

DIGITIZER INPUT - SMURFD

Location Location Location

Just as in the real estate game, the accurate location of a mine, prospect, or district is paramount. If you don't really know where a deposit is, you can't tell somebody else where it is. For GS MRDS a digitizer is required to determine latitude and longitude data. The procedure is simple, (1) locate the position of the site or area on a 1:24,000 or similarly detailed map (2) let the digitizer do the work. The digitizer makes less work out of determining a location, providing an output to .xxx seconds (latitude or longitude), than a geologist estimating position to the nearest second. The UPDATE program supplied with GS MRDS takes the file created by the digitizer and enter the latitude and longitude values into the MRDS database without rekeyboarding the data.

DIGITIZING LATITUDE/LONGITUDE POINT AND AREA OUTLINE DATA

The following instructions apply to a GTCO Digi-Pad digitizer using the 16 button cursor. The program SMURFD.EXE must be in the active directory.

Turn digitizer on -- then, from the keyboard of the PC invoke the digitizing program by typing its name at the prompt: B>SMURFD

The following will be seen on the screen:

ENTER FILENAME PORTION OF OUTPUT FILENAME: CLIMAX

IS THIS A NEW FILE? (Y/N): Y

ENTER LAT/LON OF NORTHWEST CORNER

DD,MM,SS,DDD,MM,SS

? 39,22,30,106,15,0

ENTER LAT/LON OF SOUTHWEST CORNER

DD,MM,SS,DDD,MM,SS

? 39,15,0,106,15,0

ENTER LAT/LON OF SOUTHEAST CORNER

DD,MM,SS,DDD,MM,SS

? 39,15,0,106,07,30

ENTER LAT/LON OF NORTHEAST CORNER

DD,MM,SS,DDD,MM,SS

? 39,22,30,106,07,30

ENTER NORTHWEST CORNER ON DIGITIZER

(Use the "0" key on
the digitizer keypad)

ENTER SOUTHWEST CORNER ON DIGITIZER

ENTER SOUTHEAST CORNER ON DIGITIZER

ENTER NORTHEAST CORNER ON DIGITIZER

After the last entry from the digitizer keypad, the screen will clear and the following will be seen:

SMURFD DIGITIZING PROGRAM

INSTRUCTIONS

ENTER DATA ON DIGITIZER AS FOLLOWS:

1. AT LOUD BEEP ENTER FIVE DIGITS FOR IDENTIFIER
(IDENTIFIER > 90000 TO STOP)
2. AT SOFT BEEP ENTER DATA USING KEYS AS DEFINED BELOW
 - 0 KEY - POINT ON LINE OR AREA
 - 1 KEY - SINGLE POINT OR LAST POINT ON LINE
 - 2 KEY - POINT AND THEN CLOSE THE AREA

FIRST POINT IS CENTER OF AREA, LINE OR SINGLE POINT
AND WILL CONSTITUTE MRDS POINT RECORD
SUBSEQUENT POINTS DEFINE LINE OR AREA OUTLINE

Complete the digitizing as required for the given map, and leave the program by entering 99999 from the keypad.

To digitize data from a map where the corner data has previously been entered, follow instructions as below:

ENTER FILENAME PORTION OF OUTPUT FILENAME: **CLIMAX**
IS THIS A NEW FILE? (Y/N): N (No entry of lat/long data is required.)
ENTER NORTHWEST CORNER ON DIGITIZER (Enter using the "0" key
ENTER SOUTHWEST CORNER ON DIGITIZER from the keypad.)
ENTER SOUTHEAST CORNER ON DIGITIZER
ENTER NORTHEAST CORNER ON DIGITIZER

Following entry of the NORTHEAST CORNER point from the keypad, the screen will clear and digitizing instruction screen will be displayed. Follow directions as before: new data points will be added to existing files.

Three files are generated, (1) FILENAME.PNT that contains point records (only the first point for an area record), (2) FILENAME.SAF that contains the data for the outlines of areas and districts, FILENAME.DEF that contains latitude/longitude data of corner points for future digitizing sessions.

The following page provides an example of the printout generated during the digitizing process (the record is a district record). The entry following "EOD" gives the area of the district in square miles (AREA = 0.26).

```

FILENAME = CLIMAX
NORTHWEST CORNER LAT/LON = 39 22 30 106 15 0
SOUTHWEST CORNER LAT/LON = 39 15 0 106 15 0
SOUTHEAST CORNER LAT/LON = 39 15 0 106 7 30
NORTHEAST CORNER LAT/LON = 39 22 30 106 7 30
SCALE FACTOR X AXIS= -.6092419715076315
SCALE FACTOR Y AXIS= -.6111186701079639
ROTATION ANGLE = -1.551121176065297 BETA= 5.814400161998091D-03 ALPHA=
 1.556935576227295
0001239 20 41.570N106 11 37.722W
00012
 39 19 19.871N106 10 07.877W
EOD
0012439 22 20.405N106 10 10.051W
00124
 39 22 20.690N106 10 00.310W
 39 22 13.857N106 09 57.666W
 39 22 12.373N106 09 50.694W
 39 22 06.022N106 09 56.638W
 39 22 06.887N106 10 13.940W
 39 22 13.477N106 10 15.668W
 39 22 20.690N106 10 00.310W
EOD
AREA = 0.07

```

Notes:

- The area identifier must be a five digit number: if lacking sufficient digits, enter "00005" instead of "5".
- An error message "Device I/O Error in line 3860" is sometimes seen after entering the "0" from the keypad for the first corner point, and the user returned to the DOS prompt (B>). SMURFD will normally run correctly if restarted. The latitude/longitude information will not be required if the same filename is specified, and "N" entered indicating that the file is not a new file.

MERGING OF DIGITIZED LATITUDE/LONGITUDE DATA WITH THE MRDS DATABASE

A program named "UPDATE.PRG" is provided that will enter digitized point data into the MRDS data base from a file named "GEO.PNT".

1. Using standard DOS commands create a file named GEO.PNT that contains all of the digitized FILENAME.PNT records. This is easily done with the COPY command:

B> Copy GEO.PNT + FILENAME.PNT

copies FILENAME.PNT at the end of GEO.PNT.

Similarly, all of the __.SAF files should be collected into a single file GEO.SAF. The creation of these two GEO files is best done during, or at the end of a digitizing session, and not left for some future time.

2. Enter dBASE

At the dot prompt enter

.do update

This will enter the latitude/longitude information into the MRDSGEO data base, and from this, into the MRDS data base.

Notes:

- The WF_NUMBER of MRDS must match the Sample ID entered from the digitizer key pad, or the record will not be entered.

- A scan or edit of the GEO.PNT file before updating the files is well worthwhile to check for errors, duplication, or to remove unwanted points. Sorting the GEO.PNT file (see standard DOS command) assists in this check).

B> SORT <GEO.PNT > GEO.SRT (Sort GEO.PNT file, delete
B> DEL GEO.PNT unsorted file, rename final file)
B> RENAME GEO.SRT GEO.PNT

PLOTTING GS MRDS DATA

Plots of MRDS data on the UTM projection can be done using SMURFP. The program offers the choice of a small number of different symbols, complete choice in size of symbols numbers, posting or non-posting of locality numbers, and of plotting points only, or of points and area outlines as digitized. Any scale can be specified, providing that points are chosen that are within reasonable range of plotter size capabilities.

Making plot files using dBASE III commands.

Plotting is done from files of point data generated using the output program "GEO.FRM", cleaning up the file with a program that leaves an ASCII file (such as nondocument mode WORDSTAR or SIDEKICK), with data on area outlines contained in a single file, such as GEO.SAF.

Selection of the points for plotting from a single file is done using the capabilities of dBASE III to select on the basis of the contents of a single or of multiple fields (not memo fields). For instructions, see dBASE documentation. The example below asks for sorting to identify all records within one 1° x 2° quadrangle. It sets output to a file named PUEBLO.PNT, identifies the database to be used (MRDS), and finally asks for selection of points inside the Pueblo quadrangle.

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MRDSGEOPLOT

```
00001 38 07 53.297N 105 35 59.427W AM
00002 38 14 07.626N 105 43 39.058W SM
00003 38 13 29.687N 105 44 39.375W AM
00004 38 13 15.256N 105 44 20.332W SM
00005 38 14 02.354N 105 40 46.775W SM
00006 38 13 43.050N 105 40 22.284W SM
00007 38 05 54.135N 105 36 15.412W SM
00011 38 23 03.880N 105 41 57.825W SM
00012 38 30 00.000N 105 42 14.103W AM
00013 38 20 33.321N 105 25 17.698W SB
00014 38 22 05.956N 105 23 32.022W SM
00015 38 19 43.690N 105 33 55.857W SM
00016 38 28 13.781N 105 35 09.195W SB
00017 38 28 41.855N 105 34 45.579W SB
00018 38 45 39.346N 105 08 50.748W AM
00019 38 16 02.837N 105 32 41.657W AB
00020 38 25 10.207N 105 40 23.086W BM
00021 38 09 15.893N 105 27 05.468W AB
00022 38 10 30.591N 105 26 28.523W SM
00024 38 30 43.805N 105 57 43.648W AM
```

. SET ALTERNATE OFF

To generate the final plot file, the data above must be cleaned up by deleting all lines except for data lines -- this includes lines of "blanks". The final point file looks like the one below:

```
00001 38 07 53.297N 105 35 59.427W AM
00002 38 14 07.626N 105 43 39.058W SM
00003 38 13 29.687N 105 44 39.375W AM
00004 38 13 15.256N 105 44 20.332W SM
00005 38 14 02.354N 105 40 46.775W SM
00006 38 13 43.050N 105 40 22.284W SM
00007 38 05 54.135N 105 36 15.412W SM
00011 38 23 03.880N 105 41 57.825W SM
00012 38 30 00.000N 105 42 14.103W AM
00013 38 20 33.321N 105 25 17.698W SB
00014 38 22 05.956N 105 23 32.022W SM
00015 38 19 43.690N 105 33 55.857W SM
00016 38 28 13.781N 105 35 09.195W SB
00017 38 28 41.855N 105 34 45.579W SB
00018 38 45 39.346N 105 08 50.748W AM
00019 38 16 02.837N 105 32 41.657W AB
00020 38 25 10.207N 105 40 23.086W AM
00021 38 09 15.893N 105 27 05.468W AB
00022 38 10 30.591N 105 26 28.523W SM
00024 38 30 43.805N 105 57 43.648W AM
```

The first column contains the locality number (WF_NUMBER), the next seven columns contain the latitude and longitude, and the final contains site/area distinctions. The M,N, or B (the final character) isn't used.

Interactive plotting

The SMURFP plot program is invoked by typing its name at the DOS prompt:

B> **SMURFP**

Entries will be requested: follow directions provided on the screen: this example uses interactive plotting, the second uses the plot file alternative.

```
BATCH (Y/N)? N
MINIMUM LATITUDE OF PLOT AREA (DD,MM,SS)= 38,0,0
MAXIMUM LATITUDE OF PLOT AREA (DD,MM,SS)= 39,0,0
MINIMUM LONGITUDE OF PLOT AREA (DD,MM,SS)= 105,0,0
MAXIMUM LONGITUDE OF PLOT AREA (DD,MM,SS)= 106,0,0
ENTER MAP SCALE DESIRED ON PLOT (X,Y): 500000
ENTER TICK MARK INTERVAL(DD,MM,SS)? 0,30,0
MAP SIZE = X,Y 6.904546041020304 8.774331439783628
SEND OUTPUT TO ONLINE PLOTTER (Y/N)?Y
ROTATE (Y/N)? N
ENTER WIDTH,HEIGHT FOR LABEL CHARACTERS: .07,.1      (inches)
ENTER SIZE OF SYMBOL: 50                             (rasters)
ENTER FILENAME OF POINT RECORDS: PUEBLO.PNT
ENTER FILENAME OF AREA RECORDS : GEO.SAF
DO YOU WANT AREA OUTLINES? (Y/N) Y
DO YOU WANT TO POST WF NUMBERS? (Y/N) Y
ENTER PEN #,LINE TYPE CODE,SYMBOL CODE: 1,1,1
POST ANOTHER FILE ON SAME PLOT?(Y/N): Y
CHANGE PARAMETERS(Y/N)? Y
ENTER WIDTH,HEIGHT FOR LABEL CHARACTERS: .07,.1
ENTER SIZE OF SYMBOL: 100
ENTER FILENAME OF POINT RECORDS: PUEBLO.PNT
ENTER FILENAME OF AREA RECORDS : GEO.SAF
DO YOU WANT AREA OUTLINES? (Y/N) N
DO YOU WANT TO POST WF NUMBERS? (Y/N) N
ENTER PEN #,LINE TYPE CODE,SYMBOL CODE: 1,0,3
POST ANOTHER FILE ON SAME PLOT?(Y/N): N
```

The final "N" answer returns the system to the DOS prompt.

Plotting using a batch file

Most plots should be made with a batch file to facilitate the process and reduce errors. If the first question in SMURFP is answered with a Y (yes) - BATCH (Y/N)? Y

The next asks for the name of the plot file, and the program runs to completion, then returns the system to the DOS prompt.

The plot file is an ASCII file (such as those generated by nondocument mode WORDSTAR or SIDEKICK) and provides the data needed to run the program, see example below:

```
38,0,0
39,0,0
105,0,0
106,0,0
500000,500000
0,30,0
Y
N
50
PUEBLO.PNT
GEO.SAF
Y
Y
1,1,1
N
```

The final "N" completes the plot process, specifying that you do not wish to plot any additional data.

Examples of plots

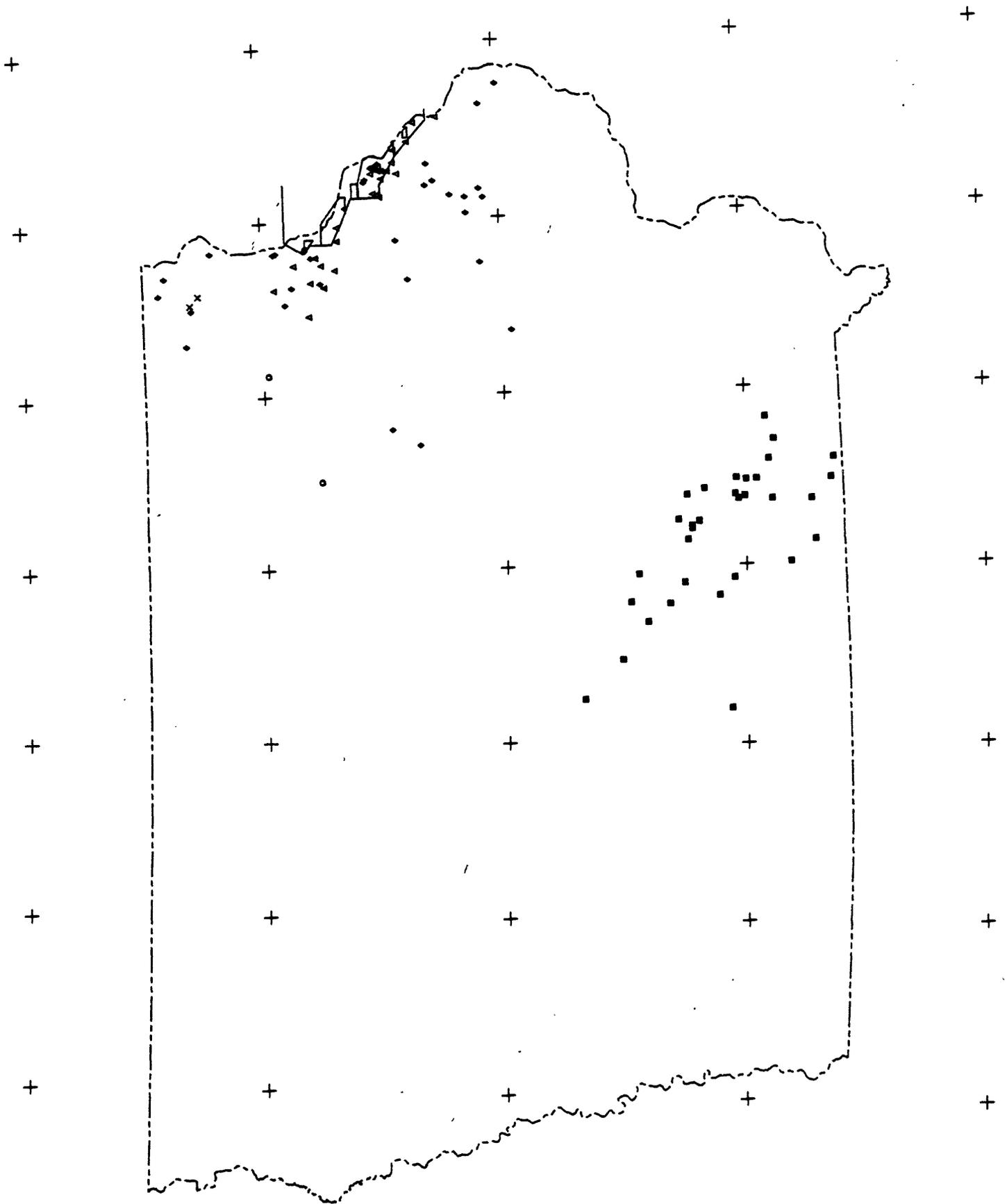
Three examples are included here to indicate a few of the possibilities for output from this program.



Selected ore deposits and districts, west half, Pueblo 1° X 2° quadrangle, Colorado



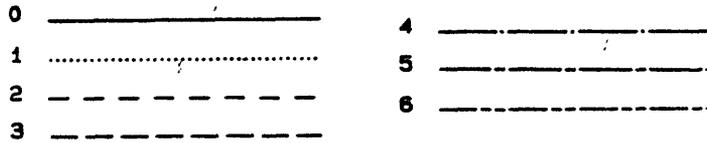
Proterozoic deposits, western Colorado



Deposits and occurrences, base metals and phosphate rock, Iowa

Lines and symbols

Lines and symbols are specified by number in the SMURFP plotting program. The available line types and symbol types are shown below.



Line types



Symbol types

Notes:

- Sizes of symbols are set in the plot program, measured in rasters (about 1/1,000 inch).
- The size of lettering is set in the plot program, measured in inches (the smallest useful size, X,Y, is about 0.067,0.1; another useful size is 0.1,0.15).
- Tick marks are drawn with pen 1, therefore a fine black pen is normally used in this slot.
- Fine-tip pens draw sharper symbols than coarse-tip pens.

OUTPUT TO THE NATIONAL MRDS (ne CRIB) SYSTEM

The carefully crafted files created by GS MRDS can be painlessly put into form for inclusion in the National MRDS system.

With printer on, and in dBase III, with dot prompt --

.DO MRDSOUT ; a screen will appear asking for the beginning and ending record numbers; enter these. The default numbers 1 and 10 appear on the screen -- put in the numbers that you want.

6

12

After entering the second number requested, the program MRDSOUT.PRG will begin to put information from MRDS.DBF, MRDS.DBT, REFER.DBF and REFER.DBT into a new output file named MRDSOUT.TXT.

At the present time, the national MRDS system requires that all letters be capital letters, and that a precise format be used; therefore, when the dot prompt is seen issue the command

.RUN FILECONV this will create a file named MRDSOUT.CNV which is entirely in upper case letters, and in form to merge easily with the national file. The command RUN enables one to operate a program external to dBASE while remaining in dBASE. The program FILECONV.EXE reformats the file, changes lower case letters to upper case, and puts the data into a file named MRDSOUT.CNV ----

Copy MRDSOUT.CNV to a floppy disc using some catchy file name, and mail the disc to:

MRDS
Branch of Resource Analysis
U.S. Geological Survey
National Center, Mailstop 920
Reston, VA 22092

Good conduct medal

You deserve one. Please note that the computer did all the work.

Examples of MRDSOUT.TXT and MRDSOUT.CNV

Examples of MRDSOUT.TXT and MRDSOUT.CNV are included here to show what these pieces of output should look like. Regrettably, the national MRDS file does not use both upper and lower case letters.

MRDSOUT.TXT

B40 <00001>

B20 <X1M>

G1 <85 01>

B30 <1>

G2 <Taylor, R.B.>

G5 <USGS>

A10 <Verde Creek area>

A11 <>

A30 <Verde Creek area>

A60 <Custer>

A50 <CO>

A40 <US>

A92 <Pueblo>

A91 <250000>

A90 <Beckwith Mountain>

A100 < 24000>

A70 <38-07-53.297N>

A80 <105-35-59.427W>

C10 <AG CU >

PROD

YES

D10 < Known production prior to 1901; no data on amount, either tonnage or grade. Size of dumps suggests small production; area primarily known for silver.

>

C40 <vein>

K1A <granitic gneiss>

N30A <no formal name>

N30 <E PROT>

K3 <OLIGO ?>

N15 <Rocky Mountain Cordillera>

K2A <>

K2 <>

C30 <chalcopyrite, galena>

K4 < Quartz veins contain minor barite and sulfide minerals; no data on alteration minerals; the host gneiss is sheared and chloritized, but the chlorite may not be related to the vein system.

>

K5 < Veins follow fractures and shears in Precambrian gneiss and adjacent Pennsylvanian-Permian rocks near the range-front fault separating the Sangre de Cristo Range from the Wet Mountain Valley graben to the east.

>

N85 < Quartz veins of unspecified size are chiefly in fractured Precambrian gneiss; mineralization extended into adjacent sedimentary rocks but veins there are lower in grade. Assays show silver in about half of the veins sampled (grab samples, .x-61 oz Ag/ton); a few samples contained gold

(.05 oz Au/ton). No information of continuity of veins; most less than a foot thick.

>

GEN < Mineralized area bounded by faults on west side, covered by Quaternary rocks to north and south and by Miocene valley-fill to east; mineralization perhaps related to hydrothermal system set up by the Oligocene Rita Alto stock, with permeability related to fractures near the Sangre de Cristo fault.

>

F1 < Ellis, C. L., Hannigan, B.J., Thompson, J. R., 1983, Mineral investigation of Sangre de Cristo Wilderness Study Area, Alamosa, Custer, Fremont, Huerfano, and Saguache Counties, Colorado: U.S. Bureau of Mines, Open-File Report, MLA 65-83, 190p.

>

EOR<>

MRDSOUT.CNV

CRIB

B40<00001>

B20<X1M>

G1<85 01>

B30<1>

G2<TAYLOR, R.B.>

G5<USGS>

A10<VERDE CREEK AREA>

A30<VERDE CREEK AREA>

A60<CUSTER>

A50<CO>

A40<US>

A92<PUEBLO>

A91<250000>

A90<BECKWITH MOUNTAIN>

A100<24000>

A70<38-07-53.297N>

A80<105-35-59.427W>

C10<AG CU >

PROD

YES

D10<KNOWN PRODUCTION PRIOR TO 1901; NO DATA ON AMOUNT, EITHER TONNAGE OR GRADE. SIZE OF DUMPS SUGGESTS SMALL PRODUCTION; AREA PRIMARILY KNOWN FOR SILVER.>

C40<VEIN>

K1A<GRANITIC GNEISS>

N30A<NO FORMAL NAME>

N30<E PROT>

K3<OLIGO ?>

N15<ROCKY MOUNTAIN CORDILLERA>

C30<CHALCOPYRITE, GALENA>

K4<QUARTZ VEINS CONTAIN MINOR BARITE AND SULFIDE MINERALS; NO DATA ON ALTERATION MINERALS; THE HOST GNEISS IS SHEARED AND CHLORITIZED, BUT THE CHLORITE MAY NOT BE RELATED TO THE VEIN SYSTEM.>

K5<VEINS FOLLOW FRACTURES AND SHEARS IN PRECAMBRIAN GNEISS AND ADJACENT PENNSYLVANIAN-PERMIAN ROCKS NEAR THE RANGE-FRONT FAULT SEPARATING THE SANGRE DE CRISTO RANGE FROM THE WET MOUNTAIN VALLEY GRABEN TO THE EAST.>

N85<QUARTZ VEINS, OF UNSPECIFIED SIZE ARE CHIEFLY IN FRACTURED PRECAMBRIAN GNEISS; MINERALIZATION EXTENDED INTO ADJACENT SEDIMENTARY ROCKS BUT VEINS THERE ARE LOWER IN GRADE. ASSAYS SHOW SILVER IN ABOUT HALF OF THE VEINS SAMPLED (GRAB SAMPLES, .X-61 OZ AG/TON); A FEW SAMPLES CONTAINED GOLD (.05 OZ AU/TON). NO INFORMATION OF CONTINUITY OF VEINS; MOST LESS THAN A FOOT THICK.>

GEN<MINERALIZED AREA BOUNDED BY FAULTS ON WEST SIDE, COVERED BY QUATERNARY ROCKS TO NORTH AND SOUTH AND BY MIOCENE VALLEY-FILL TO EAST; MINERALIZATION PERHAPS RELATED TO HYDROTHERMAL SYSTEM SET UP BY THE OLIGOCENE RITA ALTO STOCK, WITH PERMEABILITY RELATED TO FRACTURES NEAR THE SANGRE DE CRISTO FAULT.>

F1<ELLIS, C. L., HANNIGAN, B.J., THOMPSON, J. R., 1983, MINERAL INVESTIGATION OF SANGRE DE CRISTO WILDERNESS STUDY AREA, ALAMOSA, CUSTER, FREMONT, HUERFANO, AND SAGUACHE COUNTIES, COLORADO: U.S. BUREAU OF MINES, OPEN-FILE REPORT, MLA 65-83, 190P.>

@

ADDITIONS TO THE STANDARD GS MRDS SET OF DATA FIELDS

The national MRDS system contains a host of entries which could be added to this system. An effort has been made here to keep the number of GS MRDS entries down, yet provide the information that an assessment project might need for sorting, plotting, analysis of resource potential, and finally, publication. Certain additional entries have been needed, and suggestions made here for ways of handling these additions.

Section, Township, and Range

This information has been used in many tables for location, and in some areas is convenient way to locate an occurrence, even if not generally plottable by computer driven devices. The national MRDS system has an entry system for Cadastral locations that uses fields labeled A77 for Township(s), A78 for Range(s), A79 for Section(s), A76 for Section fraction(s), and A81 for the Meridian. This system does not suit dBASE III output tables without using an inordinate amount of space. We suggest that if Sec., T., R., data is needed for tables, that a single new field, perhaps named CADASTERAL be introduced into GS MRDS following the Longitude field, and that entries be made in standard USGS publication format, "SW 1/4, SE 1/4, Sec. 22, T. 17 S., R. 20 W.". Determination of the meridian can be left to the user of the tables, given the other location information available, including latitude and longitude, and the names of the quadrangles used for location. A cadasteral field probably should be a 40 to 68 character field.

Mine descriptions

The national MRDS system provides a field M220 called "Description of workings comments" which would provide a type of entry consistent with a short text description of mine workings. If such a data entry field is needed, a name such as MINE_DES could be used, and perhaps placed in the GS MRDS database structure following PROD_INFO.

Area outlines

The digital data specifying outlines of mineralized areas can be added to the database if desired. If a file containing the area outline for a single area is created, it can be imported into a memo field (one perhaps named SAF, see previous example), using the ^KR command to avoid retyping.

Program revisions required by addition of fields

If additions are needed to the standard lists of fields, revisions will be required to MRDS.DBF (additions of fields), and to supporting programs: MENUPROC.PRG, MRDSOUT.PRG, LISTALL.PRG, and other reports. In addition, output forms should be changed to use the added fields (programs with *.FRM names).

HARDWARE AND SOFTWARE

Hardware

Descriptions of required hardware can be found in OF 86-42. Briefly, an IBM PC, PC/XT, or PC/AT, or completely compatible clone is needed, a GTCO digitizer, and a HP 7550A plotter. The plotter connects with serial port 1, the digitizer with serial port 2, the printer (any kind) with parallel port 1. Baud rate is 9600 for the plotter.

A word processing program such as nondocument mode WORDSTAR or SIDEKICK is needed to generate plot files.

Software

A listing of MRDS programs is provided near the opening of this documentation. A program DBASE2MA.EXE provides an interface with GSMAP Version 3.0, a map compilation and drafting program based on latitude/longitude data storage.

DBASE2MA

The data input program DBASE2MA provides an easy way to enter data from GS MRDS plot files into GSMAP Version 3.0. The point plot file has the following format:

```
00001 38 37 53.026N 106 00 15.630W AM
00002 38 30 32.095N 106 11 44.514W SM
00003 38 30 42.178N 106 11 43.953W SM
00004 38 38 13.027N 105 59 54.550W AM
00005 38 35 21.653N 106 01 11.669W SM
```

The corresponding "area" file has the format shown below:

```
00001
  41 14 07.708N092 47 43.281W
  41 14 39.870N092 47 33.553W
  41 14 39.978N092 46 31.286W
```

EOD

```
00004
  41 01 28.873N092 37 38.784W
  41 01 13.224N092 37 07.747W
  41 01 13.236N092 36 22.568W
```

EOD

The program is started by entering -
DBASE2MA

Screen prompts will call for entry of data for the GSMAP data base that will be created from the point and area files -

```
ENTER MAP DATA BASE NAME: NEWBASE
ENTER TITLE OF MAP; NEWTITLE
ENTER QUAD # (1=NW,2=NE,3=SE,4=SW): 1
ENTER LAT/LON OF NORTHWEST CORNER
DD,MM,SS,DDD,MM,SS: 39,0,0,106,0,0
ENTER LAT/LON OF SOUTHWEST CORNER
DD,MM,SS,DDD,MM,SS: 38,0,0,106,0,0
ENTER LAT/LON OF SOUTHEAST CORNER
DD,MM,SS,DDD,MM,SS: 38,0,0,104,0,0
ENTER LAT/LON OF NORTHEAST CORNER
DD,MM,SS,DDD,MM,SS: 39,0,0,104,0,0
ENTER FILENAME OF POINT RECORD FILE: point.pnt
ENTER LINE CODE FOR POINTS: 102
ENTER FILENAME OF AREA RECORD FILE: area.saf
ENTER LINE CODE FOR AREA RECORDS: 12
ANOTHER FILE?(Y/N) N
```

Notes:

- See GSMAP Version 3 documentation for the meaning of the stuff in the example above.
- The format of data entry above follows standard GSMAP practice. Answering "Y" to the "ANOTHER FILE?(Y/N) query allows entry of data from other "point" and "area" data files. - 100 series line codes should be used for point data. The program will enter the specified line code, the specified point number as Parameter 1, and a "0" for Parameter 2. Specification of plot symbols and sizes will then be done in the plot procedure. Changes to other line codes, symbols, or sizes can be done on a line number by line number basis using the GSMAP program.
- 1-99 or 400 series line codes can be used for the area records. If 400 series codes are used, be sure that all "area" records begin and end with the same point, or strange fill patterns may be created during plotting.
- If no line data is to be entered, entry of an arbitrary line code and file name will enable execution of the program, as it won't check the contents of the "area" file unless directed to it by an "A" in the point file.
- Use of the GSMAP plot format greatly increases the plotting options available: it enables text and line entry, provides many additional symbols, supports polygon fills and special downloadable characters (such as the Cambrian "C"), and makes possible the use of many different types of HP plotters.

BELLS AND WHISTLES SUPPLIED BY dBASE III PLUS

Use of dBASE III PLUS allows the use of additional commands, and easy generation of multiple screen formats for data entry.

Screen formats

Examples of screen formats are provided to assist data entry.

TUTOR

The format "TUTOR" supplied as the file TUTOR.FMT consists of a series of six entry screens with text describing the contents of the field. It assists the first-time user in remembering the contents assigned to each field in the MRDS record.

GS MRDS

A microcomputer system for data input, organization and retrieval of mineral occurrence data based on the data fields of the national MRDS system. This data entry format, dubbed TUTOR, serves as an introduction to data entry.

WF_NUMBER 00001 The working file number is assigned by the user; the number will be used by the program UPDATE to add the latitude/longitude information generated by the digitizer (SMURFD). This number must be unique. '0's must be used if the number has less than the required 5 digits (eg. '5' should be entered as '00005').

MRDS_NO The MRDS number is assigned by the national MRDS system. do not enter any number unless one has already been assigned for this particular record.

CMR_NO 0006000 The CMR number is assigned for use in the CMR data system.

REC_TYPE AM This is a 2-character code describing the type of record. The first character is an 'S' for a site, or an 'A' for an area. The second character is an 'M' for a metallic deposit, an 'N' for a nonmetallic deposit, or a 'B' if both metallic and nonmetallic commodities are present.

ENTRY_DATE 01/23/85 Date of completion of data entry, or of final update.

Enter two digits for month (06), two for day (03), and two for year (86)

INFO_SRCE 1 A one digit code used to describe the principal source of information used to create the record. The codes are:

- | | |
|--------------------------|------------------------------|
| 1 Published literature | 2 Unpublished reports, files |
| 3 Field observations | 4 MRDS (national system) |
| 5 Personal communication | |

REPORTER Taylor, R.B. The name of the reporter, entered in the format - last name, first name, middle initial.

REPORT_AFF USGS The name of the organization for which the reporter works. Use abbreviations if unique, USGS, etc.

SITE_NAME Verde Creek area Enter the best known or most recently applied name.

SYNONYMS
Enter other names by which the site has been known. For district records, enter names of principal mines within the district.

SITE_TYPE A A one character code indicating the type of site.
M mine P prospect C claim O occurrence
D mining district (geologic outline) A mineralized area

DIST_AREA Verde Creek area Best known, or most recent name of the mining district or area.

COUNTY Custer Name of county: enter in full, but do not enter the word 'county'.

STATE CD Name of the State: use the two-character U. S. Postal Service code (CD).

COUNTRY US Enter the two-character abbreviation (US).

QUAD_2DEG Pueblo Enter the name of the 1 degree by 2 degree quadrangle containing the deposit. For area records, enter the name of the quadrangle containing most of the area. Do not enter the word 'quadrangle'.

PRIME_QUAD Beckwith Mountain Enter the name of the quadrangle used for digitizing the latitude/longitude position. Do not enter the word 'quadrangle'.

EDIT | (D:) | MRDS | Rec: 1/39 | | Caps

SCALE 24000 Enter the scale of the map used for digitizing location.

LATITUDE 38 07 53.297N Latitude/longitude data should be digitized, then LONGITUDE 105 35 59.427W entered using the program 'UPDATE'.

COMMODITYS Ag, Cu
Enter the commodities at the site. Use chemical symbols where appropriate. Use abbreviations from the national MRDS list. List in order of decreasing importance, if possible.

PRODUCTION Y A one digit code: 'Y' = yes, 'N' = no, '?' = unknown status

PROD_INFO memo Enter production data, dates, commodities.

DEPOS_TYPE vein
Enter a short 'label' for the type of deposit.

DEPOS_CODE 55.1 Enter a number, or a series of numbers from the list supplied for the PC MRDS database.

HR_LITH granitic gneiss Enter a short description of the lithology of the rock that forms the principal host for the deposit.

FORM_HR no formal name Enter the Formal name for the rock unit that is the principal host for the deposit.

AGE_HR E PROT Enter the abbreviation for the most specific geologic age of the rock that is the principal host for the deposit.

EDIT | (D:) | MRDS | Rec: 1/39 | | Caps

AGE_MINER ' OLIGO ? Enter the abbreviation for the most specific geologic age for the deposit (age of mineralizing event).

TECTON_SET Rocky Mountain Cordillera
 Enter a brief description of the tectonic setting for the area at the time that the deposit was formed.

AS_IG_LITH
 Enter a brief description, including formal name, for the igneous rock most closely (genetically) associated with the deposit.

AGE_AS_IG Enter the abbreviation for the age of the igneous rock described in the field above.

ORE_MINER chalcopyrite, galena
 Enter the complete name of the most important ore minerals known at the site described; use commas to separate names (ie. chalcopyrite, galena).

N_ORE_MIN memo Describe the mineralogy of the deposit.

ORE_CNTRLS memo Describe the factors that controlled mineralization, or localized ore, including structure, stratigraphy, rock chemistry.

DEPOS_DESC memo Enter a general description of the deposit.

EDIT | (D:) | MRDS | Rec: 1/39 | | | Caps

COMMENTS memo Enter geologic information about the area, comments on origin, and any other data not previously entered. Do not enter proprietary data in this field.

KEY_WORDS vein
 Enter key words useful for data search.

NOTES memo Enter comments reserved for your use, including proprietary information. This field will not be output to any other file using the standard programs.

REF_1 1 The five reference fields will access data in the 'REFER'
 REF_2 0 file, by number. Enter only one number in each field.
 REF_3 0
 REF_4 0
 REF_5 0

EDIT | (D:) | MRDS | Rec: 1/39 | | | Caps

Reports

The use of additional commands made possible by dBASE III PLUS facilitates report design. The example below, PUBLIST2.PRG uses the instruction .SET MEMOWIDTH TO 100 to increase the length of the line and facilitate the printing of memo fields. Compare the results of this printout with that derived from PUBLIST1.PRG, see earlier example.

LIST OF DATA FOR RECORD

1

Site : Verde Creek area
Synonyms :
District : Verde Creek area
File number : 00001 Site type: A Record type: AM Production: Y
Reporter : Taylor, R.B. Entry date: 01/23/85
County : Custer State: CO
To Quad : Pueblo Scale : 1:250,000
Primary Quad: Beckwith Mountain Scale : 1: 24000
Latitude : 38 07 53.297N Longitude : 105 35 59.427W
Deposit type: vein
Deposit code: 55.1 Commodities : Ag, Cu
Production : Known production prior to 1901; no data on amount, either tonnage or grade. Size of dumps suggests small production; area primarily known for silver.

Host rock:
Name : no formal name Lithology: granitic gneiss Age : E PROT

Mineralization

Age : OLIGO ?

Associated igneous rocks:

Lithology: Age :

Tectonic setting:

Rocky Mountain Cordillera

Ore minerals: chalcopyrite, galena

Deposit characteristics:

Mineralogy:

Quartz veins contain minor
pyrite and sulfide minerals;
no data on alteration
minerals; the host gneiss is
sheared and chloritized, but
the chlorite may not be
related to the vein system.

Ore controls:

Veins follow fractures and
shears in Precambrian gneiss
and adjacent
Pennsylvanian-Permian rocks
near the range-front fault
separating the Sangre de
Cristo Range from the Wet
Mountain Valley graben to the
east.

Description:

Quartz veins of unspecified
size are chiefly in fractured
Precambrian gneiss;
mineralization extended into
adjacent sedimentary rocks but
veins there are lower in
grade. Assays show silver in
about half of the veins
sampled (grab samples, .x-61
oz Ag/ton); a few samples
contained gold (.05 oz
Au/ton). No information of
continuity of veins; most less
than a foot thick.

Comments:

Mineralized area bounded by
faults on west side, covered
by Quaternary rocks to north
and south and by Miocene
valley-fill to east;
mineralization perhaps
related to hydrothermal
system set up by the
Oligocene Rita Alto stock,
with permeability related to
fractures near the Sangre de
Cristo fault.

References: Ellis, C. L., Hannigan, B.J., Thompson, J. R., 1983, Mineral investigation of Sangre de Cristo Wilderness Study Area, Alamosa, Custer, Fremont, Huerfano, and Saguache Counties, Colorado: U.S. Bureau of Mines, Open-File Report, MLA 65-83, 190p.

ACCEPTABLE PERVERSIONS OF THE STANDARD GS MRDS SYSTEM

The flexibility of the GS MRDS system permits ready modification to add new fields, delete others, and without care, this would defeat one goal of the system, the creation of accurate mineral occurrence data that can be easily added to the national MRDS system. If care is taken in modification, with an eye to the standard content of the national MRDS fields, great liberties can be taken with the dBASE system, yet will result in an acceptable output for the national system.

An example is shown here, a system designed to produce a report in a standardized format, one defined before creation of the dBASE system, yet capable of data combination into the national MRDS format for direct digital entry.

The desired report:

RECORD 00012

Name of site: United Verde Extension (UVX) mine County: Yavapai
 Commodities: Cu, Au, Ag
 Nature of site: Underground mine
 Exposure: The United Verde Extension is a blind orebody.
 Production: The United Verde Extension mine produced 3,878,825 tons of ore that averaged 10.23% copper, 0.039 opt gold, and 1.71 opt silver. The high grade of the copper reflected a supergene enriched zone over the massive sulfide body. The pyritic sulfides below the supergene zone contained 0.5 to 1.5% copper and 2 to 4% zinc.

Ore minerals: Chalcocite, cuprite, native copper, malachite, chrysocolla, azurite
 Gangue: Gangue minerals include quartz, limonite, pyrite, carbonate, chlorite, and sericite.
 Alteration: Alteration consists of Mg-rich chloritization and sericitization in the footwall and strong carbonatization and local epidotization in the hangingwall.
 Metamorphic grade: Greenschist facies; mineralogy consists of albite, sericite, chlorite, epidote group, actinolitic amphibole, quartz, calcite, and dolomite.

Unit name: Deception Rhyolite
 Lithology: Deception Rhyolite of the Ash Creek Group.
 Age: Zircons from the Cleopatra Member of the Deception Rhyolite yield an apparent age of about 1,790 m.y. (Anderson and others, 1971).

Volcanism: Basalt-andesite-(dacite)rhyolite.
 Sedimentary rocks: Associated sedimentary rocks include oxide- and sulfide-facies ferruginous chert, jasper, and fine-grained, bedded pyroclastic rocks.

Ore types: The ore types include chalcocite-rich supergene ore, massive and semi-massive sulfides beneath the supergene zone, chloritic stringer ore, silicious gossan, and auiferous chert.
 Ore texture: The supergene zone contained fine-grained orthorhombic chalcocite with well developed pisolitic structures. The massive sulfides are fine-grained and locally banded. The gold ore included spongy, silicious gossan, and locally brecciated and recemented chert.

Structure: The United Verde Extension is on the east limb of a regional anticline. The steeply-dipping Verde Fault is immediately west of the orebody.
 Geometry: The massive sulfide zones are steeply-dipping, pod-shaped bodies that are intruded by gabbro and locally faulted. The long dimension of the main orebody trends east-west.

Comments: The United Verde Extension is a proximal massive sulfide deposit.

Coordinates: Latitude 34-35-04.000N Longitude 112-06-38.000W

Reporter: M.Donnelly, P.Handverger Affiliation: Noranda

References: Anderson, C. A., Blacet, P. M., Silver, L. T., and Stern, T. W., 1971, Revision of Precambrian stratigraphy in the Prescott-Jerome area: U.S. Geol. Survey Bull. 1324C, 15 p.
 Anderson, C. A., and Creasy, S. C., 1958, Geology and ore deposits of the Jerome area, Yavapai County, Arizona: U.S. Geol. Survey Prof. Paper 308, 185 p.
 Anderson, C. A., and Nash, J. T., 1972, Geology of the massive sulfide deposits at Jerome, Arizona--A reinterpretation: Econ. Geology v. 67, no. 7, p. 845-863.
 Reber, L. E. Jr., 1938, Jerome District, some Arizona ore deposits: Arizona Bureau of Mines Bull. 145, p. 41-65.

To accomplish this report, in this format a new DMRDS structure was created, as shown below.

Structure for database : DMRDS.dbf

Field	Field name	Type	Width	Dec
1	WF_NUMBER	Character	5	
2	MRDS_NO	Character	7	
3	CMR_NO	Character	7	
4	REC_TYPE	Character	2	
5	ENTRY_DATE	Date	8	
6	INFO_SRCE	Character	1	
7	REPORTER	Character	25	
8	REPORT_AFF	Character	20	
9	SITE_NAME	Character	40	
10	SYNONYMS	Character	68	
11	SITE_TYPE	Character	1	
12	SITE_DESC	Character	40	
13	DIST_AREA	Character	40	
14	COUNTY	Character	40	
15	STATE	Character	2	
16	COUNTRY	Character	2	
17	QUAD_2DEG	Character	25	
18	PRIME_QUAD	Character	25	
19	SCALE	Character	7	
20	LATITUDE	Character	13	
21	LONGITUDE	Character	14	
22	CADASTRAL	Character	68	
23	COMMODITYS	Character	68	
24	PRODUCTION	Character	1	
25	PROD_INFO	Memo	10	
26	DEPOS_TYPE	Character	68	
27	DEPOS_CODE	Character	24	
28	HR_LITH	Character	40	
29	HR_DES	Memo	10	
30	FORM_HR	Character	25	
31	UNIT_DES	Memo	10	
32	META_GRADE	Memo	10	
33	AGE_HR	Character	15	
34	AGE_DES	Memo	10	
35	AGE_MINER	Character	15	
36	TECTON_SET	Character	68	
37	STRUCT_SET	Memo	10	
38	AS_IG_LITH	Character	68	
39	AGE_AS_IG	Character	15	
40	TYPE_VOLC	Memo	10	
41	TYPE_SED	Memo	10	
42	ORE_MINER	Character	68	
43	N_ORE_MIN	Memo	10	
44	ALT_MINER	Memo	10	
45	ORE_TEXTRE	Memo	10	
46	ORE_TYPE	Memo	10	
47	ORE_CNTRLS	Memo	10	

48	DEPOS	DESC	Memo	10
49	EXPOSURE		Memo	10
50	COMMENTS		Memo	10
51	KEY WORDS		Character	68
52	NOTES		Memo	10
53	REF_1		Numeric	3
54	REF_2		Numeric	3
55	REF_3		Numeric	3
56	REF_4		Numeric	3
57	REF_5		Numeric	3
**	Total	**		1189

This subdivision of data fields fits well with the standard output into the national MRDS system, shown below in two stages, the first as taken out using a rewritten form of MRDSOUT.PRG to a file named MRDSOUT.TXT, the second as converted in format to the MRDSOUT.CNV file.

Stage 1:

```

B40 <00Q12>
B20 <X1M>
G1 <86 03>
B30 < >
G2 <M.Donnelly, P.Handverger>
G5 <Noranda>
A10 <United Verde Extension (UVX) mine>
A11 <>
A30 <Prescott-Jerome>
A60 <Yavapai>
A50 <AR>
A40 <US>
A92 <Prescott>
A91 <250000>
A90 <Clarkdale>
A100 <1:24000>
A70 <34-35-04.000N>
A80 <112-06-38.000W>
C10 <CU AU AG >
PROD
YES
D10 < The United Verde Extension mine produced 3,878,825
      tons of ore that averaged 10.23% copper, 0.039 opt
      gold, and 1.71 opt silver. The high grade of the
      copper reflected a supergene enriched zone over
      the massive sulfide body. The pyritic sulfides
      below the supergene zone contained 0.5 to 1.5%
      copper and 2 to 4% zinc.
      >
C40 <Massive sulfide>
K1A <Rhyolite and tuffaceous metasediments>
N30A <Deception Rhyolite>
N30 <1,790 m.y.>

```

K3 <1,790 m.y.>

N15 <Island arc>

K2A <>

K2 <>

C30 <Chalcocite, cuprite, native copper, malachite, chrysocolla, azurite>

K4 < Gangue minerals include quartz, limonite, pyrite, carbonate, chlorite, and sericite.

Alteration: Alteration consists of Mg-rich chloritization and sericitization in the footwall and strong carbonatization and local epidotization in the hangingwall.

>

K5 < Ore controls include felsic volcanism and Tertiary to Recent supergene enrichment processes.

>

N85 < The massive sulfide zones are steeply-dipping, pod-shaped bodies that are intruded by gabbro and locally faulted. The long dimension of the main orebody trends east-west.

Ore types: The ore types include chalcocite-rich supergene ore, massive and semi-massive sulfides beneath the supergene zone, chloritic stringer ore, silicious gossan, and auiferous chert.

Ore textures: The supergene zone contained fine-grained orthorhombic chalcocite with well developed pisolitic structures. The massive sulfides are fine-grained and locally banded. The gold ore included spongy, silicious gossan, and locally brecciated and recemented chert.

Structure: The United Verde Extension is on the east limb of a regional anticline. The steeply-dipping Verde Fault is immediately west of the orebody.

Exposure: The United Verde Extension is a blind orebody.

>

GEN < The United Verde Extension is a proximal massive sulfide deposit.

Nature of site: Underground mine

Host rock: The host rocks include massive rhyolite, felsic fragmental rocks, and tuffaceous metasediments of the Deception Rhyolite. The feeder zone is in quartz porphyry of the Cleopatra Member.

Unit: Deception Rhyolite of the Ash Creek Group.

Metamorphic grade: Greenschist facies; mineralogy consists of albite, sericite, chlorite; epidote group, actinolitic amphibole, quartz, calcite, and dolomite.

Age: Zircons from the Cleopatra Member of the Deception Rhyolite yield an apparent age of about 1,790 m.y. (Anderson and others, 1971).

Associated volcanics: Basalt-andesite-(dacite)rhyolite.

Associated sedimentary rocks: Associated sedimentary rocks include oxide- and sulfide-facies ferruginous chert, jasper, and fine-grained, bedded pyroclastic rocks.

- >
- F1 < Anderson, C. A., Blacet, P. M., Silver, L. T., and Stern, T. W., 1971, Revision of Precambrian stratigraphy in the Prescott-Jerome area: U.S. Geol. Survey Bull. 1324C, 15 p.
- >
- F2 < Anderson, C. A., and Creasy, S. C., 1958, Geology and ore deposits of the Jerome area, Yavapai County, Arizona: U.S. Geol. Survey Prof. Paper 308, 185 p.
- >
- F3 < Anderson, C. A., and Nash, J. T., 1972, Geology of the massive sulfide deposits at Jerome, Arizona--A reinterpretation: Econ. Geology v. 67, no. 7, p. 845-863.
- >
- F4 < Reber, L. E. Jr., 1938, Jerome District, some Arizona ore deposits: Arizona Bureau of Mines Bull. 145, p. 41-65.
- >
- EOR<>

The second stage:

CRIB
 B40<00012>
 B20<XIM>
 G1<86 03>
 G2<M.DONNELLY, P.HANDVERGER>
 G5<NORANDA>
 A10<UNITED VERDE EXTENSION (UVX) MINE>
 A30<PRESCOTT-JEROME>
 A60<YAVAPAI>
 A50<AR>
 A40<US>
 A92<PRESCOTT>
 A91<250000>
 A90<CLARKDALE>
 A100<1:24000>
 A70<34-35-04.000N>
 A80<112-06-38.000W>
 C10<CU AU AG >
 PROD
 YES
 D10<THE UNITED VERDE EXTENSION MINE PRODUCED 3,878,825 TONS OF ORE THAT AVERAGED 10.23% COPPER, 0.039 OPT GOLD, AND 1.71 OPT SILVER. THE HIGH GRADE OF THE COPPER REFLECTED A SUPERGENE ENRICHED ZONE OVER THE MASSIVE SULFIDE BODY. THE PYRITIC SULFIDES BELOW THE SUPERGENE ZONE CONTAINED 0.5 TO 1.5% COPPER AND 2 TO 4% ZINC.>
 C40<MASSIVE SULFIDE>
 K1A<RHYOLITE AND TUFFACEOUS METASEDIMENTS>
 N30A<DECEPTION RHYOLITE>
 N30<1,790 M.Y.>

K3<1,790 M.Y.>

N15<ISLAND ARC>

C30<CHALCOCITE, CUPRITE, NATIVE COPPER, MALACHITE, CHRYSOCOLLA, AZURITE
>

K4<GANGUE MINERALS INCLUDE QUARTZ, LIMONITE, PYRITE, CARBONATE, CHLORITE, AND SERICITE. ALTERATION: ALTERATION CONSISTS OF MG-RICH CHLORITIZATION AND SERICITIZATION IN THE FOOTWALL AND STRONG CARBONATIZATION AND LOCAL EPIDOTIZATION IN THE HANGINGWALL.>

K5<ORE CONTROLS INCLUDE FELSIC VOLCANISM AND TERTIARY TO RECENT SUPERGENE ENRICHMENT PROCESSES.>

N85<THE MASSIVE SULFIDE ZONES ARE STEEPLY-DIPPING, POD-SHAPED BODIES THAT ARE INTRUDED BY GABBRO AND LOCALLY FAULTED. THE LONG DIMENSION OF THE MAIN OREBODY TRENDS EAST-WEST. ORE TYPES: THE ORE TYPES INCLUDE CHALCOCITE-RICH SUPERGENE ORE, MASSIVE AND SEMI-MASSIVE SULFIDES BENEATH THE SUPERGENE ZONE, CHLORITIC STRINGER ORE, SILICIOUS GOSSAN, AND AUIFEROUS CHERT. ORE TEXTURES: THE SUPERGENE ZONE CONTAINED FINE-GRAINED ORTHORHOMBIC CHALCOCITE WITH WELL DEVELOPED PISOLITIC STRUCTURES. THE MASSIVE SULFIDES ARE FINE-GRAINED AND LOCALLY BANDED. THE GOLD ORE INCLUDED SPONGY, SILICIOUS GOSSAN, AND LOCALLY BRECCIATED AND RECEMENTED CHERT. STRUCTURE: THE UNITED VERDE EXTENSION IS ON THE EAST LIMB OF A REGIONAL ANTICLINE. THE STEEPLY-DIPPING VERDE FAULT IS IMMEDIATELY WEST OF THE OREBODY. EXPOSURE: THE UNITED VERDE EXTENSION IS A BLIND OREBODY.>

GEN<THE UNITED VERDE EXTENSION IS A PROXIMAL MASSIVE SULFIDE DEPOSIT. NATURE OF SITE: UNDERGROUND MINE HOST ROCK: THE HOST ROCKS INCLUDE MASSIVE RHYOLITE, FELSIC FRAGMENTAL ROCKS, AND TUFFACEOUS METASEDIMENTS OF THE DECEPTION RHYOLITE. THE FEEDER ZONE IS IN QUARTZ PORPHYRY OF THE CLEOPATRA MEMBER. UNIT: DECEPTION RHYOLITE OF THE ASH CREEK GROUP. METAMORPHIC GRADE: GREENSCHIST FACIES; MINERALOGY CONSISTS OF ALBITE, SERICITE, CHLORITE, EPIDOTE GROUP, ACTINOLITIC AMPHIBOLE, QUARTZ, CALCITE, AND DOLOMITE. AGE: ZIRCONS FROM THE CLEOPATRA MEMBER OF THE DECEPTION RHYOLITE YIELD AN APPARENT AGE OF ABOUT 1,790 M.Y. (ANDERSON AND OTHERS, 1971). ASSOCIATED VOLCANICS: BASALT-ANDESITE-(DACITE)RHYOLITE. ASSOCIATED SEDIMENTARY ROCKS: ASSOCIATED SEDIMENTARY ROCKS INCLUDE OXIDE- AND SULFIDE-FACIES FERRUGINOUS CHERT, JASPER, AND FINE-GRAINED, BEDDED PYROCLASTIC ROCKS.>

F1<ANDERSON, C. A., BLACET, P. M., SILVER, L. T., AND STERN, T. W., 1971, REVISION OF PRECAMBRIAN STRATIGRAPHY IN THE PRESCOTT-JEROME AREA: U.S. GEOL. SURVEY BULL. 1324C, 15 P.>

F2<ANDERSON, C. A., AND CREASY, S. C., 1958, GEOLOGY AND ORE DEPOSITS OF THE JEROME AREA, YAVAPAI COUNTY, ARIZONA: U.S. GEOL. SURVEY PROF. PAPER 308, 185 P.>

F3<ANDERSON, C. A., AND NASH, J. T., 1972, GEOLOGY OF THE MASSIVE SULFIDE DEPOSITS AT JEROME, ARIZONA--A REINTERPRETATION: ECON. GEOLOGY V. 67, NO. 7, P. 845-863.>

F4<REBER, L. E. JR., 1938, JEROME DISTRICT, SOME ARIZONA ORE DEPOSITS: ARIZONA BUREAU OF MINES BULL. 145, P. 41-65.>

@

This text, formatted for direct entry into the national MRDS system, is painlessly acquired from files created for a different purpose using two programs, easily modified from the "standard" versions.

MINERAL OCCURRENCE DATABASE DESCRIPTIONS OF FIELDS
- OR WHAT GOES INTO EACH BLANK IN THE FORM -

RECORD NUMBER

The entry in this required field is generated automatically by the computer. Each record in a file is numbered starting with one; the working file numbers continuously increase in order of entry. (This number belongs to the computer - the PC - it does not go to the national MRSD system.)

WORKING FILE NUMBER

The entry in this field is for the convenience of the compiler of the database; any number can be used (1-99999); it is best used as a sequential entry when several different MRDS databases are being compiled. It is not a required field.
(This number belongs to the compiler.)

MRDS NUMBER:

Enter the MRDS number if one has been assigned to the deposit; otherwise, leave blank. (This number belongs to the national MRDS system.)

CMR NUMBER:

Enter the CMR record number if one has been assigned to the deposit; otherwise, leave blank. (This number belongs to CMR - it does not go to the national MRDS system.)

RECORD TYPE:

This is a two character code describing the type of record. The first character is an S if the record contains site specific information (describes a single mine, prospect, etc.). The first character is an A if the record contains information describing an area (a mineralized area, mining district, etc.). The second character is an M for metallic deposits, an N for non-metallic deposits, or a B for deposits that contain both metallic and non-metallic commodities. (Only the M,N, or B goes to the national MRDS system.)

S site	M metallic
A area	N nonmetallic
	B both metallic and nonmetallic

ENTRY DATE:

The date the data is entered into the database. Enter two digits for month (06), two for date (03), and two for year (85). Change date after editing only for substantive changes, especially if new information has been added.

INFORMATION SOURCE:

A one character code used to describe the primary type of information which was used to create the record. The codes are:

- 1 Published literature
- 2 Unpublished report, memo, file, etc.
- 3 Field observation
- 4 MRDS
- 5 Personal communication

REPORTER:

Enter the name (preferably last name, first name, middle initial) of the person responsible for the contents of the record. If an assistant is doing the actual data entry, he or she should enter his supervisor's name in this field. The purpose of this field is to provide users with a contact for further information about this particular record.

REPORTER AFFILIATION:

Enter the name of the organization for which the reporter works. Organization names may be abbreviated if the abbreviation is unique and easily recognizable (USGS, BLM, etc.).

SITE NAME:

Enter the most well known, or most recent name of the deposit, occurrence, district, or area. If the name is unknown, enter as unidentified occurrence. This is a required field.

SYNONYMS:

Enter other names by which the site has been known. If more than one name is entered, separate names with commas. For district or area records, names of important mines in the district should be entered here.

SITE TYPE:

Enter type of site or area being described by this record as a one character code from the following list:

- | | | |
|---|------------------|---|
| M | Mine | This field does not go to the national MRDS system. |
| P | Prospect | |
| C | Claim | |
| O | Occurrence | H Drill hole |
| A | Mineralized area | |
| D | Mining district | |

DISTRICT/AREA:

Enter the best known or most recent name of the mining district or mineralized area which contains the site being described, or the name of the district or area for an area record.

COUNTY:

Enter in full the county name in which the deposit is located. If the deposit is located in more than one county, separate the names with commas. Do not enter the word "county" as part of the name.

STATE:

Enter the two character, U.S. Postal Service abbreviation for the name of the state in which the deposit is located. If a district or area is located in more than one state, enter the code for the state in which most of the area is located.

AL	Alabama	MT	Montana
AK	Alaska	NE	Nebraska
AZ	Arizona	NV	Nevada
AR	Arkansas	NH	New Hampshire
AS	American Samoa	NJ	New Jersey
CA	California	NM	New Mexico
CZ	Canal Zone	NY	New York
CO	Colorado	NC	North Carolina
CT	Connecticut	ND	North Dakota
DE	Delaware	OH	Ohio
DC	District of Columbia	OK	Oklahoma
FL	Florida	OR	Oregon
GA	Georgia	PA	Pennsylvania
GU	Guam	PR	Puerto Rico
HI	Hawaii	RI	Rhode Island
ID	Idaho	SC	South Carolina
IL	Illinois	SD	South Dakota
IN	Indiana	TN	Tennessee
IA	Iowa	TT	Trust Territories
KS	Kansas	TX	Texas
KY	Kentucky	UT	Utah
LA	Louisiana	VT	Vermont
ME	Maine	VA	Virginia
MD	Maryland	VI	Virgin Islands
MA	Massachusetts	WA	Washington
MI	Michigan	WV	West Virginia
MN	Minnesota	WI	Wisconsin
MS	Mississippi	WY	Wyoming
MO	Missouri		

COUNTRY:

Enter the name, or abbreviation for the name (eg. US) of the country in which the deposit is located.

2 DEGREE QUADRANGLE:

Enter the name of the 1° x 2° quadrangle in which the deposit is located. In the case of district or area records, enter the name of the 1° x 2° quadrangle in which most of the district or area is located. Do not enter the word "quadrangle" as part of the name.

PRIMARY QUADRANGLE:

Enter the name of the quadrangle used to determine the accurate coordinates of the site location, or the boundary of the mining district or area. Normally, this will be the name of a 1:24,000 or 1:62,500 scale quadrangle. Do not enter the word "quadrangle" as part of the name.

SCALE:

Enter the denominator of the fractional scale of the primary quadrangle (24000, not 1:24,000).

LATITUDE:

Enter the latitude of the site being described to the nearest second. The format is: dd mm ssN

dd = degrees mm = minutes ss = seconds

Normally, this information is obtained by digitizing from the primary quadrangle named above. This is a required field.

LONGITUDE:

Enter the longitude of the site being described to the nearest second. The format is: ddd mm ssW. Normally, this information is obtained by digitizing from the primary quadrangle named above. This is a required field.

COMMODITIES:

Enter a list separated by commas of the known commodities at the site being described. Use the correct chemical symbols for elements (Au, Ag, Pb, etc.) and short descriptive "codes" for other minerals and materials. The list below is that of the national MRDS system; please use it, as it will facilitate search, and feed directly into the main system. If possible, list the commodities in decreasing order of importance.

Commodity Codes

ALM	Alum
AL1	Bauxite
AL2	Aluminum (from other sources)
AL3	Alunite
AMB	Amber
GYP	Anhydrite, gypsum
ASB	Asbestos
VOL	Ash, volcanic
BRI	Brines, saline materials
MG	Brucite, as well as magnesium
CAR	Carbonates
CER	Cement rock, natural
CLY	Clay, general
CL1	Bentonite
CL2	Fuller's earth
CL3	Kaolin (includes high alumina clay)
CL4	Ball clay
CL5	Fire clay (refractory)
CL6	Bloating materials (clay, shale, etc.)
CL7	Brick clay (common)
COR	Corundum
DIA	Diamond
DIT	Diatomite
DOL	Dolomite, general
DOL1	Ultra pure dolomite, $\text{CaCO}_3 + \text{MgCO}_3 > 97\%$
DOL2	High magnesian dolomite, $97\% > \text{CaCO}_3 \text{ MgCO}_3 > 95\%$
EMY	Emery
EVA	Evaporites, see also brine, halite
FLD	Feldspar
GAR	Garnet
GEM	Gem stones
GLA	Glauconite
GRF	Graphite
GYP	Gypsum, anhydrite
HAL	Halite
HAG	Heavy aggregate
KYN	Kyanite, sillimanite, andalusite, dumortierite
LAT	Laterite
LST	Limestone, general
LST1	Limestone, $\text{CaCO}_3 > 97\%$
LST2	Limestone, $97\% > \text{CaCO}_3 > 95\%$
LWA	Light weight aggregate
MGS	Magnesite
MBL	Marble
MIC	Mica, general
MIC1	Sheet mica
MIC2	Scrap mica
MIC3	Flake mica

MPG	Mineral pigments
MON	Monazite
OLV	Olivine
P	Phosphorus or phosphate
PEA	Peat
PER	Perlite
PGM	Platinum group metals
PUM	Pumice
PYR	Pyrite
PYR1	Pyrrhotite
PYF	Pyrophyllite
QTZ	Quartz
REE	Rare earth elements
REF	Refractory materials
BRI	Salines, brines
SAP	Saprolite
SIL	Silica
TLC	Talc, serpentine, soapstone
VRM	Vermiculite
WOL	Wollastonite
ZEO	Zeolites

PRODUCTION:

A one character field which indicates whether production has been known to occur. Codes are as follows:

Y	known production
N	known to have not produced
?	production history unknown

PRODUCTION INFORMATION:

Enter into this text field information about the production history of the deposit, if any. Include known dates of production, commodities produced, and data on tonnage and/or grade of ore produced.

DEPOSIT TYPE:

Enter a concise label, or labels that you would attach to the type of deposit being described by this record (epithermal vein, massive sulfide, Mississippi Valley, placer, etc.).

DEPOSIT TYPE CODE:

Enter the code number from the following list which best describes the deposit. If several deposit types are present, enter the code numbers describing them in order of importance; separate these code numbers with commas. These code numbers provide a structured entry to facilitate sorting by deposit type. This entry will not be transmitted to the main MRDS file.

Deposit type code

- 10. Placer deposits
 - 10.2 Modern
 - 10.21 Alluvial
 - 10.22 Marine, including beach, strand line
 - 10.4 Fossil
 - 10.41 Alluvial
 - 10.42 Marine, including beach, strand line
 - 10.47 Quartz-pebble conglomerate (Au, U, Th, Rand)

- 12. Residual deposits
 - 12.2 Resistate (mechanical)
 - 12.22 barite (Missouri)
 - 12.4 Chemical (concentrations, alteration minerals)
 - 12.42 clays
 - 12.44 bauxite
 - 12.46 iron (including "bog iron, manganese")
 - 12.48 vermiculite
 - 12.49 nickel (Riddle, OR)

- 14. Supergene base and precious metals

- 20. Organic-rich sedimentary deposits
 - 20.2 peat
 - 20.6 shale (metal-rich)
 - 20.62 metal-rich black shale

- 22. Syngenetic sedimentary deposits
 - 22.2 clays
 - 22.25 lithium clays
 - 22.3 shales (bloating, light-weight aggregate)
 - 22.4 carbonate rocks
 - 22.42 limestone
 - 22.44 dolomite
 - 22.46 nahcolite
 - 22.6 phosphorite
 - 22.8 evaporite
 - 22.82 gypsum-anhydrite-sulfur
 - 22.84 saline minerals
 - 22.86 saline brines

- 24. Iron formation
- 26. Sedimentary manganese
 - 26.2 bedded (Kalahari field)
 - 26.4 nodules
- 28. Sedimentary (bedded) barite
- 30. Syngenetic massive (and disseminated) sulfides
 - 30.2 Sedimentary (Rammelsberg)
 - 30.4 Iron formation, sulfide bearing
 - 30.6 Volcanic-hosted
 - 30.61 Ophiolite assemblage (Cyprus)
 - 30.63 Felsic to intermediate (Kuroko)
 - 30.8 Metamorphosed syngenetic sulfide deposits
 - 30.81 Zn-Cu (Sedalia type)
 - 30.83 W-Cu (Firefly type)
- 36. Diagenetic sedimentary deposits
 - 36.2 clays
 - 36.4 zeolites
 - 36.42 saline lake (closed system)
 - 36.44 altered tuffs (open system)
 - 36.6 fluorite (Rome, OR)
 - 36.8 metals in sedimentary rocks
- 40. Epigenetic sedimentary-hosted deposits
 - 40.2 sandstone-hosted metals
 - 40.22 sandstone uranium, vanadium, silver
 - 40.24 sandstone-hosted "Mississippi Valley" (Laisvall, Sweden)
 - 40.4 sandstone, shale-hosted metals
 - 40.42 copper (Kupferschiefer)
 - 40.44 molybdenum (SD Badlands)
 - 40.6 carbonate-hosted metals
 - 40.62 "Mississippi Valley" base metals, cobalt
 - 40.64 Dolomitic Cu-Co (Zaire Cu)
- 50. Geothermal energy
 - 50.2 Steam
 - 50.4 Hot water (only)
- 52. Hot spring deposits
 - 52.1 carbonates (travertine)
 - 52.2 clays
 - 52.3 metals
 - 52.33 sedimentary rock-hosted
 - 52.35 volcanic-hosted

- 55. Hydrothermal (volcanic-subvolcanic)
 - 55.1 veins
 - 55.2 stockworks
 - 55.3 breccia pipes
 - 55.4 mantos
 - 55.5 disseminated
 - 55.55 volcanic Cu (Keeweenaw, MI)
 - 55.6 unconformity-vein (uranium)

- 57. Contact metamorphic
 - 57.1 Cu (Pb-Zn-Au-Ag-Mo, Carr Fork, UT)
 - 57.2 Zn-Pb (Ag-Cu-W, Ban Ban, Australia)
 - 57.5 W (Mo-Zn-Cu, Pine Creek, CA)
 - 57.6 Sn (W-F-Be, Lost River, AK)
 - 57.7 Fe (Cu-Co-Au, Daiquiri, Cuba)
 - 57.8 Nonmetallics
 - 57.81 magnesite (magnesite, brucite, Gabbs, NV)
 - 57.83 marble

- 58. Porphyry
 - 58.1 Cu
 - 58.3 Cu-Mo (Au)
 - 58.4 Au
 - 58.5 Mo (W)
 - 58.7 Sn

- 59. Greisen
 - 59.1 disseminated
 - 59.3 veins
 - 59.5 pegmatite-greisen veins

- 60. Volcanic-plutonic rocks
 - 60.1 pumice and perlite

- 66. Magmatic seggregations, granitic plutons
 - 66.1 pegmatites
- 67. Magmatic seggregations, mafic-ultramafic plutons
 - 67.1 sulfide (immiscible melts)
 - 67.11 podlike (Sudbury)
 - 67.13 layered, interstitial (Bushfeldt Pt)
 - 67.3 cumulates
 - 67.31 stratiform chromitite
 - 67.32 disseminated chromite
 - 67.34 podiform
 - 67.6 intrusive
 - 67.61 magnetite, chromite, ilmenite
 - 67.7 extrusive
 - 67.71 magnetite (lava)

- 68. Magmatic differentiates, undersaturated plutons (syenite-ultramafic complexes)
 - 68.5 intrusive
 - 68.51 carbonatite
 - 68.7 extrusive
 - 68.71 carbonate (lava)
- 69. Kimberlite pipes (diamond pipes)
 - 69.1 alnoite (diamond-bearing, Kimberly, Australia)
- 70. Meta-ultramafic
 - 70.1 asbestos
 - 70.3 serpentine
- 75. Regional metamorphic
 - 75.2 aluminosilicate minerals
 - 75.3 marble
 - 75.7 graphite
 - 75.8 talc

Commodities that should **NOT** be entered in MRDS files

- Oil and gas
- Sand and gravel (common aggregates)
- Dimension stone
- Coal

HOST ROCK LITHOLOGY:

Enter a concise description of the lithology of the rock which forms the principal host for the deposit.

HOST ROCK NAME:

Enter the formal name of the unit which forms the principal host for the deposit.

HOST ROCK AGE:

Enter the abbreviation for the most specific geologic age of the rock which forms the principal host for the deposit. A range of ages may be entered separated by a hyphen (Cret-Tert).

Cen	Cenozoic	Pal	Paleozoic
Quat	Quaternary	Perm	Permian
Holo	Holocene	Penn	Pennsylvanian
Pleis	Pleistocene	Carb	Carboniferous
Tert	Tertiary	Miss	Mississippian
Neo	Neogene	Dev	Devonian
Paleog	Paleogene	Sil	Silurian
Plio	Pliocene	Ord	Ordovician
Mio	Miocene	Camb	Cambrian
Oligo	Oligocene	Prec	Precambrian
Eo	Eocene	Prot	Proterozoic
Paleo	Paleocene	Arch	Archean
Mes	Mesozoic	E	Early
Cret	Cretaceous	M	Middle
Jur	Jurassic	L	Late
Tri	Triassic		

MINERALIZATION AGE:

Enter the abbreviation for the most specific geologic age of the mineralization of the deposit. Use the same abbreviations used for the age of the host rock. A range of ages may be entered separated by a hyphen (Cret-Tert). If the mineralization has been dated radiometrically, include that information in the "Deposit Description" field.

TECTONIC SETTING:

Enter a brief description of the tectonic setting of the site or area at the time the deposit was formed.

ASSOCIATED IGNEOUS ROCK:

Enter a brief description of any igneous rock genetically associated with the mineralization. Include the formal name, if any, and the lithology.

ASSOCIATED IGNEOUS ROCK AGE:

Enter the abbreviation for the most specific geologic age of the genetically associated igneous rock. Use the same abbreviations used for the age of the host rock. A range of ages may be entered separated by a hyphen (Cret-Tert). If the associated igneous rock has been dated radiometrically, include that information in the "Deposit Description" field.